CALENDAR
OF
THE UNIVERSITY
OF
NEW SOUTH WALES

1959

POSTAL ADDRESS
BOX 1, POST OFFICE, KENSINGTON
TELEPHONE FF0351
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(Information in this Calendar has been brought up to date as at 31st December, 1958)

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Calendar—1959

First Term .......... February 23rd to May 16th.
Second Term .......... June 1st to August 22nd.
Third Term .......... September 7th to November 28th.

January—

February—
    Tuesday 3 .......... Professorial Board meets.
    Monday 16 .......... Enrolments begin.
    Monday 23 .......... First term begins.

March—
    Wednesday 4 ...... Faculty of Science meets.
    Monday 9 .......... Council meets.
    Tuesday 10......... Professorial Board meets.
    Wednesday 11 ...... Faculty of Architecture meets.
    Wednesday 18 ...... Faculty of Commerce meets.
    Friday 20 .......... Conferring of Degrees—Newcastle University College.
    Wednesday 25 ...... Faculty of Engineering meets.
    Friday 27 to Monday 30................. Easter Holidays

April—
    Wednesday 1 ...... Faculty of Technology meets.
    Tuesday 14......... Professorial Board meets.
    Wednesday 15 ...... Faculty of Humanities and Social Sciences meets.
    Saturday 18 ........ Conferring of Degrees.
    Wednesday 29 ...... Faculty of Science meets.

May—
    Monday 11 .......... Council meets.
    Tuesday 12......... Professorial Board meets.
    Saturday 16 ........ First term ends.
    Monday 18 to  Saturday 30 ...... Vacation (2 weeks).
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June—

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<td>Professorial Board meets.</td>
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<td>Faculty of Engineering meets.</td>
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<td>Monday 15</td>
<td>Queen's Birthday—Public Holiday.</td>
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<td>Wednesday 17</td>
<td>Faculty of Science meets.</td>
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<td>Wednesday 24</td>
<td>Faculty of Technology meets.</td>
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July—

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<td>Tuesday 14</td>
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<td>Wednesday 22</td>
<td>Faculty of Commerce meets.</td>
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<td>Wednesday 29</td>
<td>Faculty of Science meets.</td>
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August—

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<td>Tuesday 11</td>
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September—

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<td>Monday 14</td>
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<td>Tuesday 15</td>
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<td>Wednesday 16</td>
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<td>Saturday 19</td>
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<td>Monday 21</td>
<td>Industrial training begins—two term courses not engaged in Survey Camp.</td>
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<td>Monday 21 to Friday 25</td>
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Monday 21 to Friday, October 2. Survey Camp—1st, 2nd, 3rd and 4th years course VIIA, 2nd, 4th and 6th years course VIIB.
Monday 28  .......... Industrial training begins—two term courses attending one week Survey Camp, except 3rd year of courses VII, VIIA and VIII.
Monday 28 to Friday, October 2. Geology excursion—3rd year of courses VII, VIIA, VIIB and VIII, 4th year of courses VII and VIIB.
Wednesday 30  ....... Faculty of Engineering meets.

October—
 Monday 5  .......... Six Hour Day—Public Holiday.
 Tuesday 6  .......... Industrial Training begins—1st, 2nd and 3rd years course VIIA, 3rd year of courses VII, VIIA and VIII.
 Wednesday 7  ....... Faculty of Technology meets.
 Tuesday 13 ........... Professorial Board meets.
 Wednesday 14 ....... Faculty of Humanities and Social Sciences meets.
 Wednesday 21 ....... Faculty of Science meets.

November—
 Monday 9  .......... Council meets.
 Tuesday 10 .......... Professorial Board meets.
 Saturday 14 ......... Lectures cease—diploma and three-term degree courses.
 Wednesday 18 ....... Faculty of Commerce meets.
 Saturday 21 ......... Examinations begin—diploma and three-term degree courses.
 Saturday 28 ......... Third term ends.

December—
 Tuesday 8 .......... Professorial Board meets.
 Saturday 12 ......... Examinations end—diploma and three-term degree courses.

1960

February—
 Tuesday 9 .......... Professorial Board meets.
 Monday 9  .......... Enrolments begin.
 Monday 22 .......... First term begins.
PREFACE

The University was incorporated in 1949 by Act of the New South Wales Parliament—initially under the name of “The New South Wales University of Technology”—to help meet the growing demand in Australia for scientists and technologists, through the provision of expanded means of advanced training and research.

Early in 1958 the University Council indicated its willingness to extend the activities of the University to include the provision of courses leading to degrees in medicine and arts and, accordingly, the Incorporating Act was amended by the University of New South Wales Act, 1958, to provide the Council with the necessary powers to offer instruction, initiate research and award degrees in these fields and to change the name of the University to “The University of New South Wales”. This Act took effect from 7th October, 1958.

The objects of the University as set out in the Incorporating Act, as amended, are:

(a) The provision of facilities for higher specialised instruction and advanced training in the various branches of technology and science in their application to industry and commerce; and

(b) the aiding by research and other suitable means of the advancement and development of science in its application to industry and commerce; and

(c) to provide instruction and carry out research in the disciplines of humane studies and medicine and in such other disciplines as the Council may from time to time determine.

Consequent to its new power to conduct courses in medicine the University Council has taken preliminary steps towards the establishment of a Medical School and it is expected that the first year of a course leading to a degree in medicine will be offered in 1960.

The governing body of the University is the Council which is representative of Parliament, industry and commerce, agriculture, the trade unions, technical education, professional bodies, the University of Sydney, and of the University's own professorial and teaching staff and its undergraduates and graduates.

The principal academic bodies of the University are the Professorial Board and the Faculties of Science, Engineering, Technology, Architecture, Commerce, and Humanities and Social Sciences. The Professorial Board is charged with the duty of furthering and co-ordinating the work of Faculties and Departments, of encouraging scholarship and research and of considering the studies and discipline of the University. The respective Faculties are responsible for the supervision of teaching and for examining in the subjects with which
they are concerned and for considering and reporting to the Professorial Board (or, in certain circumstances, the Council) upon all matters relating to the studies, lectures, examinations and Degrees of the Faculty.

The University offers a wide range of courses in the principal scientific and technological disciplines, leading to the award of first degrees in Science, Engineering, Architecture, Commerce and Surveying.


The Bachelor of Engineering degree may be taken in Civil, Electrical, Mechanical, Industrial and Mining Engineering, and in Applied Geology and Naval Architecture. The degree of Bachelor of Commerce may be obtained in Accountancy, Economics, Applied Psychology, Industrial Relations, Statistics and Wool Commerce.

Most of the degree courses offered by the University are available on both a full-time and a part-time basis. In general, full-time courses extend over four years, while part-time students usually attend the University over a period of seven years. Candidates for honours are normally required to complete an additional programme of studies, although in some cases honours are awarded on the results of the ordinary course.

Two features are emphasized in the planning of most first degree courses of the University of New South Wales. The first is the inclusion of industrial experience as an essential part of the courses to supplement the laboratory and lecture-room work at the University. In the Faculty of Engineering this practical work occupies five months in each of the first three years, and is supervised and organised to suit the stage and syllabus of each course of study. A different pattern obtains in the Faculty of Science where, for example, in the case of Applied Chemistry, the first and second years are full-time at the University while the third and fourth years are part-time at the University concurrently with appropriate industrial employment.

Secondly, in all faculties, the study of general subjects, such as language and literature, history, philosophy, economics and psychology, is compulsory. These courses are designed to broaden the experience and interests of the student and thus to assist him to take the place in contemporary affairs for which he is otherwise qualified.

The University also provides instruction on behalf of the Department of Technical Education in a large number of part-time diploma courses, leading to the award of Associateship of Sydney Technical
College. In many cases diploma courses are offered in fields in which there is also a part-time degree course available. In such cases the diploma course usually consists of the first five stages of the part-time degree course. Should a student who has taken the diploma at the end of his fifth year subsequently decide to proceed to a degree, he may do so by completing the sixth and seventh stages of the degree course.

The University provides facilities for students to proceed to the higher degrees of Master of Science, Master of Engineering, Master of Architecture and Master of Commerce. The requirements for the award of any one of these degrees may normally be completed over two years and include the preparation of a thesis which embodies the results of an original investigation. The University also offers courses leading to the award of the degree of Master of Technology. The requirements for this degree include the successful completion of courses of advanced lectures and a project and usually involve one year of full-time study or two years of part-time study. The degree of Doctor of Philosophy may be awarded in the Faculties of Science, Technology, Engineering and Architecture and usually involves three years' work.

The University is housed on two main sites. The permanent site of the University is in the Sydney suburb of Kensington where the larger part of the University’s academic and administrative activities are carried out. The Engineering Schools and a large part of the Chemistry School are still located in the grounds of Sydney Technical College, at Broadway. There has been considerable building activity at Kensington over the last few years and it is expected that the rate of development on this site will be accelerated in the immediate future.

The University’s Act of Incorporation gives the Council power to establish colleges and departments within the State of New South Wales. Action has been taken under this authority to establish a college of the University at Newcastle which provides a wide range of the University’s degree courses, both full-time and part-time. Courses leading to a degree in Arts are also offered at the College. Prior to the passing of the University of New South Wales Act, 1958, these courses led to the award of the B.A. degree of the University of New England. The 1958 Act, however, gave the University power to award its own degrees in this field, and from 1959 students enrolling in Arts courses at Newcastle will proceed to the degree of Bachelor of Arts of the University of New South Wales.

Instruction in a number of science and engineering courses is also provided in the country centres of Wollongong, Broken Hill, Orange and Lithgow where the University’s staff and equipment is housed in the technical colleges in these towns.
ACT OF INCORPORATION

There are three Acts of the Parliament of New South Wales which relate to the incorporation of the University:—

(i) The Technical Education and New South Wales University of Technology Act, 1949, by which the University was incorporated under its original name, “The New South Wales University of Technology”, with the object of meeting the demand in Australia for increasing numbers of scientists and technologists.

(ii) The Technical Education and New South Wales University of Technology (Amendment) Act, 1955, by which the original Act was amended to alter the titles of President, Vice-President and Director to Chancellor, Deputy Chancellor and Vice-Chancellor, respectively, and to increase the maximum membership of the University's Council from thirty to thirty-nine.

(iii) The University of New South Wales Act, 1958, by which the name of the University was altered to “The University of New South Wales”, the objects of the University extended to include the provision of instruction and research in medicine and arts, and in such other disciplines as the Council may from time to time determine, and the financial year brought into conformity with the calendar year.

These three Acts are together cited as the Technical Education and University of New South Wales Act, 1949-1958.

TECHNICAL EDUCATION AND UNIVERSITY OF NEW SOUTH WALES ACT, 1949-1958

PART III

THE UNIVERSITY OF NEW SOUTH WALES

DIVISION 1.—Preliminary

Commencement

14. This Part of this Act shall, except where otherwise expressly provided, commence upon a day to be appointed by the Governor and notified by proclamation published in the Gazette.

Definitions

15. In this Part of this Act, unless the context or subject matter otherwise indicates or requires—

"By-laws" means by-laws made under this Part of this Act
“Council” means the Council of the University.
“Prescribed” means prescribed by this Part of this Act or by the regulations.
“Regulations” means regulations made under this Part of this Act.
“University” means the University of New South Wales.

DIVISION 2.—Incorporation of the University and Establishment of a Council thereof.

University of New South Wales

16. (1) There shall be a University of New South Wales consisting of the Council, the professors and such other classes of persons giving instruction within the University as may be prescribed and the graduate and undergraduate members thereof.

(2) The University shall be a body corporate under the name of “The University of New South Wales” with perpetual succession and a common seal, and shall be capable by that name of suing and being sued, and of doing and suffering all such other acts and things as bodies corporate may by law do and suffer.

(3) The University shall, subject to this Part of this Act and the regulations, have power to take, purchase, hold, grant, alienate, demise or otherwise dispose of real and personal property:

Provided that the University shall not, except with the approval of the Governor, alienate, mortgage, charge or demise any real property.

Common Seal

17. (1) The common seal of the University shall be kept in such custody as the Council directs, and shall not be used except upon resolution of the Council.

(2) All courts, judges and persons acting judicially shall take judicial notice of the common seal of the University affixed to any document, and shall presume that it was duly affixed.

Objects of the University

18. The objects of the University shall include the following:—

(a) to provide facilities for higher specialised instruction and advanced training in the various branches of technology and science in their application to industry and commerce; and

(b) to aid by research and other suitable means the advancement, development, and practical application of science to industry and commerce; and
to provide instruction and carry out research in the disciplines of humane studies and medicine and in such other disciplines as the Council may from time to time determine.

The Council

19. (1) There shall be a Council of the University which shall have and may exercise and discharge the powers, authorities, duties and functions conferred and imposed upon the Council by or under this Part of this Act.

(2) The Council shall consist of not more than thirty-nine members who shall be appointed by the Governor.

Of the members so appointed—

(a) five shall be appointed on the nomination of the Minister, being persons who, in the opinion of the Minister, by their knowledge and experience can advance the full development of the University;

(b) one shall be a member of the Legislative Council elected by that Council;

(c) one shall be a member of the Legislative Assembly elected by that Assembly;

(d) four shall be appointed on the nomination of the Minister to represent persons engaged in the professions;

(e) two shall be officers within the meaning of the Public Service Act, 1902, as amended by subsequent Acts, directly concerned with and engaged in the administration of technical education and shall be appointed on the nomination of the Minister;

(f) five shall be appointed on the nomination of the Minister to represent industrial and commercial interests;

(f1) two shall be appointed on the nomination of the Minister to represent agricultural, pastoral and rural interests;

(g) three shall be appointed on the nomination of the Minister to represent trade unions and employee organisations;

(h) one shall be appointed upon the nomination of the Senate of the University of Sydney;

(h1) one shall be the person for the time being holding the office of Chairman of the Professorial Board of the University.
(i) one shall be a person having the qualifications as prescribed by the by-laws, elected in the manner prescribed by the by-laws, by undergraduates within the University;

(j) not more than seven, the number to be determined in accordance with the provisions of subsection (2A) of this section, shall be persons having the qualifications as prescribed by the by-laws, elected, in the manner prescribed by the by-laws, by the graduates of the University;

(k) one shall be a person elected, in the manner prescribed by the by-laws, by the professors and such other classes of persons giving instruction within the University as may be so prescribed;

(l) one shall be the person for the time being holding the office of Vice-Chancellor of the University;

(m) not more than four shall be persons elected in the manner prescribed by the by-laws to represent such principal faculties as may be so prescribed.

(2A) The number of persons to be elected pursuant to paragraph (j) of subsection two of this section shall be—

(a) where the number of the graduates of the University does not exceed five hundred, two;

(b) where the number of the graduates of the University exceeds five hundred but does not exceed one thousand, three;

(c) where the number of the graduates of the University exceeds one thousand, four and one for each additional one thousand graduates in excess of one thousand and one until the maximum number of seven is attained.

For the purposes of this section "graduate" means person whose name appears on the list of electors comprised of graduates prepared in accordance with the by-laws.

(3) The person or persons to be nominated by the Minister for appointment pursuant to paragraph (d), (f), (f1), or (g) of subsection two of this section shall, in respect of each such paragraph, be selected by him from a panel of such number of names as may be prescribed submitted to him for the purpose by such person or class or classes of persons or body or bodies of persons as may be prescribed in relation to that paragraph.

The regulations may prescribe—

(a) the time within which any such panel of names shall be submitted to the Minister;
(b) where any such panel of names is to be submitted by more than one prescribed class or body of persons, the number of names which each such class or body is entitled to include in such panel.

(4) If for any reason a panel of names is not submitted to the Minister in accordance with this section or the regulations or is not submitted within the time prescribed with respect thereto, the Minister may nominate such person or persons as he thinks fit and such person or persons shall be deemed to have been validly nominated in accordance with subsection three of this section and the regulations.

(5) (a) Members of the Council, other than the Vice-Chancellor of the University, and the Chairman of the Professorial Board of the University, shall, subject to this Part of this Act, hold office for such period not exceeding four years as may be prescribed. Different periods may be prescribed in respect of the different classes of members.

The Vice-Chancellor of the University shall hold office while he remains Vice-Chancellor.

The Chairman of the Professorial Board of the University shall hold office while he remains Chairman of that Board.

(b) The regulations may provide for the retirement in rotation of members of any particular class and for that purpose may provide that, on the first appointment of members of any such class after the introduction of rotational retirement, such number as may be prescribed of the members of that class shall be appointed for a less period than that prescribed pursuant to paragraph (a) of this subsection with respect to members of that class.

(c) All retiring members shall, unless otherwise disqualified, be eligible for reappointment.

(6) Where a casual vacancy occurs in the office of a member of the Council the Governor may appoint a person to the vacant office. The person so appointed shall have the like prescribed qualification (if any) as that of the member whose office has become vacant and shall, subject to this Part of this Act, hold office for the residue of his predecessor's term of office.

(7) The provisions of the Public Service Act, 1902, as amended by subsequent Acts, shall not apply to or in respect of the appointment by the Governor of any member of the Council, and any member so appointed shall not, in his capacity as such member, be subject to the provisions of such Act during his term of office.
Vacation of Office

20. A member of the Council shall be deemed to have vacated his office if he—

(a) dies;

(b) resigns his office by writing under his hand addressed to the Governor;

(c) becomes bankrupt, compounds with his creditors or makes any assignment of his salary or estate for their benefit;

(d) becomes an insane person or patient or an incapable person within the meaning of the Lunacy Act, 1898-1947;

(e) absents himself from four consecutive meetings of the Council without leave of the Council; or

(f) in the case of a member elected by either House of Parliament—ceases to be a member of that House.

Chancellor and Deputy Chancellor

21. (1) The first Chancellor and the first Deputy Chancellor of the University shall be the persons who, immediately before the day upon which Her Majesty’s assent to the Technical Education and New South Wales University of Technology (Amendment) Act, 1955, is signified, held office as President and Vice-President of the University respectively. Such persons shall hold office as Chancellor and Deputy Chancellor for the remainder of the period for which and upon the terms and conditions upon which they would have held office as President and Vice-President respectively had the said Act not been enacted.

(2) Wherever a vacancy in the office of Chancellor or Deputy Chancellor occurs the Council shall elect one of its number to be Chancellor or Deputy Chancellor of the University.

(3) The Chancellor and Deputy Chancellor shall, subject to subsection one of this section, hold office for such period and on such terms and conditions as may be prescribed by the by-laws.

Chairman

22. At every meeting of the Council the Chancellor or, in his absence, the Deputy Chancellor, shall preside as Chairman, but if the Chancellor and Deputy Chancellor are both absent, the members present shall elect a person from among their number to preside as chairman.
Questions How Decided

23. (1) All questions which come before the Council shall be decided at any meeting duly convened, at which a quorum is present, by a majority of the votes of the members present.

(2) The chairman at any such meeting shall have a vote; and in case of an equality of votes a second or casting vote.

(3) At any such meeting ten members shall form a quorum.

Validity of Acts and Proceedings

24. (1) No act or proceeding of the Council or any committee of the Council, or of the Vice-Chancellor or any person acting pursuant to any direction of the Council shall be invalidated or prejudiced by reason only of the fact that at the time when such act or proceeding was done, taken or commenced there was a vacancy or vacancies, not exceeding twelve in number, in the office or offices of any member or members of the Council.

(2) All acts and proceedings of the Council or any committee of the Council, or of the Vice-Chancellor or any person acting pursuant to any direction of the Council shall, notwithstanding the subsequent discovery of any defect in the appointment, nomination or election of any member of the Council, or that any such member was disqualified from acting as or incapable of being a member of the Council, be as valid as if such member had been duly appointed, nominated or elected and was qualified to act as or capable of being a member and had acted as a member of the Council and as if the Council had been properly and fully constituted.

Division 3.—Administration

Powers of the Council

25. Subject to this Part of this Act and to the regulations and by-laws, the Council—

(a) may provide courses in applied science, engineering, technology, commerce, industrial organisation and such other courses as it deems fit and may, after examination, confer the several degrees of Bachelor, Master and Doctor, and such other degrees and such certificates in the nature of degrees or otherwise as it thinks fit;

(b) may from time to time appoint deans, professors, lecturers and other officers and employees of the University;

(c) shall have the entire control and management of the affairs, concerns and property of the University; and
(d) may act in all matters concerning the University in such manner as appears to it best calculated to promote the objects and interests of the University:

Provided that no appointment of a dean, professor, lecturer or other officer or employee shall be made pursuant to this section before the day appointed and notified pursuant to subsection three of section thirty-three of this Act.

Vice-Chancellor

26. (1) There shall be a Vice-Chancellor of the University who shall be the chief executive officer of the Council.

(2) The Vice-Chancellor shall have and may exercise and discharge such powers, authorities, duties and functions as may be prescribed in the regulations and by-laws.

(3) The Vice-Chancellor shall be appointed in the manner prescribed and shall hold office for such period and upon such terms and conditions as may be prescribed.

Delegation to Committees, etc.

27. (1) The Council may constitute and appoint such committees as it thinks fit and may delegate all or any of its powers, authorities and functions (except this power of delegation and the power to make by-laws) to any such committee or to any member of the Council, or to any officer or officers of the University.

(2) Every delegation under this section shall be revocable by resolution of the Council and no delegation shall prevent the exercise or discharge by the Council of any of its powers, authorities, duties or functions.

Ad Eundem and Honorary Degrees

28. (1) Where any person has obtained in any university or other educational establishment recognised by the by-laws of the University in force for the time being any degree or diploma corresponding or equivalent, in the opinion of the Council, to any degree which the Council is now or may hereafter be empowered to confer after examination, the Council may confer such latter degree upon such person without examination.

(2) The persons upon whom degrees are conferred, under the provisions of subsection one of this section, shall be entitled to the same rights and privileges as appertain to those who have taken the same degrees in the ordinary course in the University.

(3) By-laws may be made for or with respect to the conferring of honorary degrees or other distinctions on approved persons.
Power to Establish and Maintain Branches, Departments, or Colleges

29. (1) The Council may establish and maintain branches, departments, or colleges of the University at Newcastle, Wollongong, Broken Hill or such other place in the State as the Council deems fit.

Council May Authorise Educational Establishments to Issue Certificates

(2) (a) The Council may authorise any college or educational establishment, whether incorporated or not, engaged in the promotion of applied science and technology, to issue to candidates for any degree or diploma, certificates to the effect that the candidate for any such degree or diploma has completed such course of instruction therefor as the Council by by-law prescribes.

(b) Any person who presents to the Council any such certificate may be admitted as a candidate for the degree or diploma to which it has reference.

Evidence of Degrees Conferred

30. All degrees conferred by the University shall be evidenced by a certificate under the common seal of the University and be signed by the Chancellor and the Vice-Chancellor.

Fees

31. The Council may by by-law make provision for the payment by students of the University of reasonable fees for entrance to the University, attendance at lectures, conferring of degrees and other University charges, except in the case of any student who is granted any fellowship, scholarship, exhibition, bursary or similar benefit to the extent to which he is thereby exempted from payment of fees.

Technological and Scientific Investigation

32. (1) The Council may carry out special investigations in any technological or scientific matter at the request of any authority, institution, association, firm or person, and in respect of any such investigation may charge such fees therefor and agree to such conditions in relation thereto as it thinks fit.

(2) The Council may publish information relating to any matter investigated by it pursuant to the provisions of subsection one of this section or otherwise:

Provided that no such publication shall be made in contravention of any condition agreed to pursuant to the said subsection.
Transitional Provisions—Appointments

33. (1) (a) During the period commencing on the date of commencement of this Part of this Act and ending on the appointed day the provisions of this subsection shall have effect.

(b) All deans, professors, lecturers and other officers and employees necessary to enable the Council to exercise and discharge the powers, authorities, duties and functions conferred and imposed upon it by this Part of this Act shall be appointed under and subject to the provisions of the Public Service Act, 1902, as amended by subsequent Acts; and every such dean, professor, lecturer or other officer or employee shall be subject to the said Act, as so amended, during his tenure of office or employment; and the permanent head of the Department of Technical Education shall in relation to such deans, professors, lecturers and other officers and employees be the permanent head within the meaning of the said Act, as so amended.

(2) Any person appointed under subsection one of this section and in office immediately before the appointed day who is not appointed by the Council to the staff of the University on that day shall be entitled, if he is under the age of sixty years, to be appointed on the recommendation of the Public Service Board to some office or position in the Public Service not lower in salary than that which he held under the said subsection immediately before the appointed day.

(3) In this section, "appointed day" means a day to be appointed by the Governor and notified by proclamation published in the Gazette. The day so appointed and notified shall not be earlier than one month after the date of the publication of such proclamation in the Gazette.

Use of Services of Officers and Employees of the Public Service

34. For the purpose of exercising and discharging the powers, authorities, duties and functions conferred and imposed on the Council by this Part of this Act the Council may, with the approval of the Minister of the Department concerned and of the Public Service Board, on such terms as may be arranged, make use of the services of any of the officers and employees of any Government Department.

Saving of Rights

35. (1) Where a person who is appointed by the Council to the staff of the University was immediately before his appointment an officer within the meaning of the Public Service Act, 1902, or an employee within the meaning of the Superannuation Act, 1916, he shall—

(a) retain any rights accrued or accruing under either of those Acts;
(b) continue to contribute to any fund or account and shall be entitled to receive any deferred or extended leave and any payment, pension or gratuity as if he were an officer or employee within the meaning of the Public Service Act, 1902, or the Superannuation Act, 1916, as the case may be, and for such purpose his service with the University shall be deemed to be service for the purposes of such Acts;

(c) in the event of his ceasing to be employed by the University (otherwise than on account of misconduct or disgraceful or improper conduct) be entitled, if he is under the age of sixty years, to be appointed upon the recommendation of the Public Service Board to some office in the Public Service not lower in classification and salary than that which he held immediately before his appointment to the staff of the University.

(2) This section shall commence upon the day appointed and notified pursuant to subsection three of section thirty-three of this Act.

Amendment of Act No. 28, 1916, Sch. III

36. (1) The Superannuation Act, 1916-1948, is amended by inserting at the end of Schedule Three thereto the following words:—

The New South Wales University of Technology.

(2) This section shall commence upon the day appointed and notified pursuant to subsection three of section thirty-three of this Act.

By-laws

37. (1) The Council may make by-laws, not inconsistent with this Part of this Act or the regulations, with respect to all matters pertaining to the University.

(2) Without prejudice to the generality of subsection one of this section the Council may make by-laws with respect to—

(a) the management, good government, and discipline of the University;

(b) the method of election of members of the Council (other than the members referred to in paragraphs (b) and (c) of subsection two of section nineteen of this Act) who are to be elected;

(c) the manner and time of convening, holding and adjourning the meetings of the Council; the manner of voting at such meetings, including postal voting or voting by proxy; the powers and duties of the chairman thereof; the conduct and
record of the business; the appointment of committees of the Council, and the quorum, powers and duties of such committees;

(d) the number, stipend, manner of appointment and dismissal of deans, professors, lecturers, examiners, and other officers and servants of the University;

(e) the entrance standards for students;

(f) the examinations for and the granting of degrees, diplomas, certificates and honours;

(g) the examinations for and the granting of fellowships, scholarships, exhibitions, bursaries, and prizes;

(h) the admission of students of other universities and technical colleges to any corresponding status or of graduates of other universities or technical colleges to any corresponding degree or diploma without examination;

(i) generally, all other matters authorised by this Part of this Act or necessary or convenient for giving effect to this Part of this Act.

(3) Every by-law made by the Council shall be sealed with the common seal of the University, shall be submitted for the consideration and approval of the Governor, and when so approved shall—

(a) be published in the Gazette;

(b) take effect from the date of publication or from a later date to be specified in the by-law.

(4) A copy of every such by-law shall be laid before each House of Parliament within fourteen sitting days after the publication thereof in the Gazette if Parliament is in session, and if not, then within fourteen sitting days after the commencement of the next session.

(5) Any such by-law may be proved in any court by the production of a verified copy under the seal of the University or by the production of a document purporting to be a copy of such by-law and to be printed by the Government Printer.

DIVISION 4.—Finance

University of New South Wales Account

38. (1) The University shall have an account which shall be called the “University of New South Wales Account” (in this section referred to as the “Account”).
(2) There shall be paid to the credit of the Account—
(a) all moneys received by the University by way of fees, charges, gifts, bequests or otherwise;
(b) all moneys made available to the University or the Council in accordance with the provisions of this Division.

(3) All expenditure incurred by the University (including the repayment of moneys borrowed by or advanced to the University in accordance with this Division) shall be paid from the Account.

Colonial Treasurer to Meet Certain Costs

39. (1) Any expenditure incurred by the University with the approval of the Governor given on the recommendation of the Colonial Treasurer is in this section referred to as approved expenditure.

(2) The Colonial Treasurer shall, in each year, pay to the University the amount by which the approved expenditure exceeds the income from all sources of the University or so much of such income as is capable of being applied for the purpose of meeting approved expenditure.

(3) Any moneys payable by the Colonial Treasurer under this section shall be paid out of moneys provided by Parliament.

Advances by Colonial Treasurer

40. The Colonial Treasurer may for the temporary accommodation of the University advance such moneys to the Council as the Governor may approve upon such terms and conditions as to repayment and interest as may be agreed upon.

Power of Council to Borrow

41. The Council may borrow money for—
(a) the purpose of carrying out or performing any of its powers, authorities, duties and functions;
(b) the renewal of loans; or
(c) the discharge or partial discharge of any indebtedness to the Colonial Treasurer or to any bank,
within such limits, to such extent and upon such conditions as to security or otherwise as the Governor upon the recommendation of the Colonial Treasurer may approve.
Accounts To Be Rendered

42. The Council shall cause to be kept proper books of account in relation to the funds of the University and shall, as soon as practicable after the thirty-first day of December in each year, prepare and transmit to the Minister for presentation to Parliament a statement of accounts in a form approved by the Auditor-General exhibiting a true and correct view of the financial position and transactions of the University.

Audit

43. The accounts of the University shall be audited by the Auditor-General, who shall have, in respect thereof, all the powers conferred on the Auditor-General by any law now or hereafter in force relating to the audit of public accounts; and the Audit Act, 1902, and any Acts amending the same, shall apply to the members of the Council and to the officers and employees of the University in the same manner as it applies to accounting officers of public departments.

Division 5.—General

No Religious Test

44. No religious test shall be administered to any person in order to entitle him to be admitted as a student of the University, or to hold office therein, or to graduate thereat, or to enjoy any benefit, advantage or privilege thereof.

Power to Accept Gifts, etc.

45. (1) The University shall have power to acquire by gift, bequest or devise any property for the purposes of this Part of this Act, and to agree to and carry out the conditions of any such gift, bequest or devise.

(2) The rule of law relating to perpetuities shall not apply to any condition of a gift, bequest or devise to which the University has agreed.

Council to Co-operate with Other Bodies

46. In the exercise of its powers, authorities, duties and functions under this Part of this Act the Council shall, so far as is practicable, co-operate with the University of Sydney, the Commonwealth Scientific and Industrial Research Organisation, the Department of Technical Education, and other Commonwealth and State institutions devoted to science and research.
47. (1) As soon as practicable after the thirty-first day of December in each year, the Council shall prepare and furnish to the Minister a report upon the proceedings of the University during the period of twelve months immediately preceding that day. Such report shall include a summary of the work, researches and investigations carried out by the University during such period.

(2) A copy of such report shall be laid before both Houses of Parliament as soon as practicable after it has been received by the Minister.

Effect of Changing Name of University

47A. (1) As from the commencement of the University of New South Wales Act, 1958, a reference in any Act, by-law, regulation or other statutory instrument or in any certificate evidencing a degree or in any other instrument or document whatsoever to the New South Wales University of Technology shall be read and construed as a reference to the University of New South Wales.

(2) The alteration of the name of the body corporate constituted under this Part effected by the amendments made to this Act by the University of New South Wales Act, 1958, does not prejudice or affect in any way the continuity of that body corporate, and that body corporate continues notwithstanding those amendments.

(3) The alteration of the name of the body corporate constituted under this Part does not affect any property, powers, rights, authorities, duties, functions, liabilities or obligations of that body corporate or of any other person, or render defective any legal or other proceedings instituted or to be instituted by or against that body corporate.

Any legal or other proceeding may be continued or commenced by or against that body corporate by the name of the University of New South Wales that might have been continued or commenced by or against that body corporate by the name of the New South Wales University of Technology.

Regulations

48. (1) The Governor may make regulations not inconsistent with this Part of this Act prescribing all matters which by this Part of this Act are required or permitted to be prescribed or which are necessary or convenient to be prescribed in relation to any matter within the powers and functions of the University and the Council and generally for carrying out or giving effect to the objects of the University and to this Part of this Act.
(2) The Regulations shall—
(a) be published in the Gazette;
(b) take effect from the date of publication or from a later date to be specified therein;
(c) be laid before both Houses of Parliament within fourteen sitting days after the publication thereof if Parliament is in session, and if not, then within fourteen sitting days after the commencement of the next session.

If either House of Parliament passes a resolution of which notice has been given at any time within fifteen sitting days after such regulations have been laid before such House disallowing any regulation or part thereof, such regulation or part shall thereupon cease to have effect.

PART IV
ACQUISITION OF LAND

49. (1) For the purposes of this Act, the Governor may, under the Public Works Act, 1912, as amended by subsequent Acts, resume or appropriate any land and the Minister may, under the said Act as so amended, purchase any land.

(2) (a) Where any land has been appropriated or resumed pursuant to this section the Governor may, by notification published in the Gazette, notify that the land so resumed or appropriated and specified in such notification is vested in The University of New South Wales.

(b) Thereupon the land so specified shall vest in the said University.

(3) For the purposes of the Public Works Act, 1912, as amended by subsequent Acts, any such resumption, appropriation or purchase shall be deemed to be for an authorised work, and the Minister shall be deemed to be the Constructing Authority:

Provided that sections thirty-four, thirty-five, thirty-six and thirty-seven of the Public Works Act, 1912, as amended by subsequent Acts, shall not apply to any such resumption, appropriation or purchase, but section thirty-eight of such Acts shall, mutatis mutandis, apply to and in respect of any contracts relating to any such resumption, appropriation or purchase.

Power to Rescind Resumptions. Cf. Act No. 7, 1912, s. 4c.

50. (1) The Governor may, by notification in the Gazette, rescind in whole or in part any notification of resumption made in pursuance of section forty-nine of this Act.
(2) Upon the publication of any notification of rescission the land described in such notification shall revest in the person who was entitled thereto immediately before the resumption for his estate, interest or right immediately before such resumption, but subject to any interest in or equity binding upon such land created by the Constructing Authority since such resumption; and the land shall be subject to all trusts, obligations, estates, interests, contracts, charges, rates, rights-of-way or other easements from which it was freed and discharged by such resumption as if the land had not been resumed and shall also be subject to any interests in or equities binding on the compensation moneys created since the resumption.

(3) On the lodgment with the Registrar-General of a copy of a notification in the Gazette rescinding a notification of resumption of land under the provisions of the Real Property Act, 1900, the Registrar-General shall cancel any entry or notification in the register book made by him pursuant to section 46A of the Real Property Act, 1900, in so far as it relates to the land the notification of the resumption of which has been rescinded, and for the purpose of any dealing with such land the entry or notification made pursuant to section 46A of the Real Property Act, 1900, shall be deemed never to have been made.

(4) The person in whom any land is revested under this section shall be entitled to be compensated by the Constructing Authority for any loss or damage actually suffered by him as a direct consequence of the resumption and its rescission other than compensation in respect of the value of the land.

(5) Any claim for compensation arising under this section shall be heard and determined in like manner and subject to the like conditions as a claim for compensation by reason of the acquisition of land under the Public Works Act, 1912, as amended by subsequent Acts, and the provisions of the Land and Valuation Court Act, 1921, as amended by subsequent Acts, shall, mutatis mutandis, apply to and in respect of the hearing and determination of any such claim.
REGULATIONS

Interpretation

1. In these Regulations, "Act" means the Technical Education and University of New South Wales Act, 1949-1958.

Incorporation of the University

2. For the purposes of subsection one of section sixteen of the Act, "lecturers and fellows of the University" are hereby prescribed as classes of persons giving instruction within the University.

Submission to Minister of Panels of Names Relating to the Appointment of Certain Members of the Council of the University

3. (1) The persons to be nominated by the Minister for appointment —

(a) pursuant to paragraph (d) of subsection two of section nineteen of the Act shall be selected by him from a panel of twenty-four names submitted to him by the organisations specified in Part A of the Schedule hereto;

(b) pursuant to paragraph (f) of the same subsection shall be selected by him from a panel of eighteen names submitted to him by the organisations specified in Part B of the Schedule hereto;

(b1) pursuant to paragraph (f1) of the same subsection shall be selected by him from a panel of eight names submitted to him by the organisations specified in Part B1 of the Schedule hereto;

(c) pursuant to paragraph (g) of the same subsection shall be selected by him from a panel of five names submitted to him by the organisations specified in Part C of the Schedule hereto.

(2) The number of names which each such organisation is entitled to include in the appropriate panel shall be the number specified in the said Schedule opposite the name of such organisation.

(3) All names which any such organisation, other than an organisation specified in Part B1 of the Schedule hereto, is entitled to include in a panel shall, in respect of the first appointment of members to the Council of the University, be submitted to the Minister not later than the twenty-eighth day of June, one thousand nine hundred and forty-nine, and in respect of any subsequent
appointment of members to that Council, be submitted to the Minister
not later than the fourteenth day of June in the year in which any
such appointment is to be made.

(4) All names which any organisation specified in Part B1
of the Schedule hereto is entitled to include in a panel shall, in
respect of the first appointment of members to the Council of the
University pursuant to paragraph (f1) of subsection two of section
nineteen of the Act, be submitted to the Minister not later than the
fourteenth day of June, one thousand nine hundred and fifty-five,
and in respect of any subsequent appointment of members pursuant
to that paragraph, be submitted to the Minister not later than the
fourteenth day of June in the year in which any such appointment
is to be made.

SCHEDULE

Part A

Representation of Persons Engaged in the Professions

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<th>Organisation</th>
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<tr>
<td>The Institution of Engineers, Australia, Sydney Division</td>
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<tr>
<td>The Institution of Engineers, Australia, Newcastle Division</td>
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<td>The Royal Australian Chemical Institute (N.S.W. Branch)</td>
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<td>The Institute of Optometrists of New South Wales</td>
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<td>The Royal Australian Institute of Architects, New South Wales Chapter</td>
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<td>The Institution of Production Engineers (Sydney Section)</td>
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<td>The Institute of Physics (Australian Branch, N.S.W. Division)</td>
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<td>The Australasian Institute of Mining and Metallurgy</td>
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Part B

Representation of Industrial and Commercial Interests

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<td>Metal Trades Employers’ Association</td>
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<td>Building Industry Congress of New South Wales</td>
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<td>The Institute of Management</td>
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Part B1

Representation of Agricultural, Pastoral and Rural Interests

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<td>The Graziers’ Association of New South Wales</td>
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<td>Farmers and Settlers’ Association of New South Wales</td>
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<td>Wheat and Woolgrowers’ Association of New South Wales</td>
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Part C

Representation of Trade Unions and Employee Organisations

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<td>The University of New South Wales Staff Association</td>
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<tr>
<td>New South Wales Public Service Association</td>
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</table>

**Period of Office**

4. (1) The members of the Council of the University, other than the Vice-Chancellor of the University, the Chairman of the Professorial Board of the University and the members referred to in clauses two, three and four of this Regulation, shall, subject, to the Act, hold office for a period of four years.

(2) The member of the Council of the University elected by the Legislative Council shall, subject to the Act, hold office until his successor has been elected by the Legislative Council as hereinafter provided and has been appointed by the Governor to the Council of the University.

After the first election of a member by the Legislative Council in the year one thousand nine hundred and forty-nine each subsequent election shall be held as soon as practicable after the commencement of the term of service of the fifteen members of the Legislative Council elected at each triennial election of members of the Legislative Council held after such year.

(3) The member of the Council of the University elected by the Legislative Assembly shall, subject to the Act, hold office until his successor has been elected by the Legislative Assembly as hereinafter provided and has been appointed by the Governor to that Council.

After the first election of a member by the Legislative Assembly in the year one thousand nine hundred and forty-nine each subsequent election shall be held at soon as practicable after every general election of members of the Legislative Assembly held after such year.

(4) The members of the Council appointed pursuant to paragraphs (i), (j), (k) and (m) of subsection two of section nineteen of the Act shall hold office for a period of two years: Provided that the members first appointed pursuant to paragraphs (i), (k) and (m) of the said subsection shall hold office for a period of one year.

The Vice-Chancellor

5. (1) The Vice-Chancellor shall be the chief executive officer of the Council and shall be specially charged with the duty of promoting the interests and furthering the development of the University.
(2) The Vice-Chancellor shall, under the Council, subject to the by-laws and to any resolution of the Council—

(a) manage and supervise the administrative, financial and other activities of the University;

(b) consult with and advise the Professorial Board, and all other University Boards, Faculties, Committees, Professors, and other Heads of Departments;

(c) exercise supervision over the discipline of the University, with power, in the case of students, to impose penalties in accordance with academic usage for breach of discipline or for misconduct of any kind;

(d) give effect to the by-laws and to any resolution or report passed or adopted by the Council;

(e) perform such other duties as may from time to time be assigned to him by the Council.

(3) Nothing in this Regulation shall affect the precedence or authority of the Chancellor or Deputy Chancellor.
BY-LAWS

CHAPTER I.—THE CHANCELLOR AND DEPUTY CHANCELLOR

1. (a) The Chancellor shall hold office for a period commencing from his election and terminating at the close of the ordinary meeting of Council next preceding the expiration of two years from the date of his election.

(b) The Deputy Chancellor shall hold office for a period commencing from his election and terminating at the close of the ordinary meeting of the Council next preceding the expiration of two years from the date of his election.

(c) Any retiring Chancellor or Deputy Chancellor shall be eligible for re-election.

2. (a) The Chancellor and Deputy Chancellor shall, by virtue of their office, be members of any Committee constituted by any By-law or by any resolution of the Council and of any Board or Faculty within the University.

(b) The Chancellor may preside at any meeting of any such Committee, Board or Faculty and shall have all the rights and powers of the Chairman of any such Committee, Board or Faculty.

(c) If the Chancellor is absent or does not desire or is unable to act, or if the office of Chancellor is vacant, the Deputy Chancellor may preside at any such meeting and shall have the like rights and powers.

(d) In the absence of the Chancellor, or if the office of Chancellor is vacant, any powers or duties conferred or imposed upon the Chancellor by these By-laws may be exercised and discharged by the Deputy Chancellor.

(e) This By-law shall have effect notwithstanding the provisions of any other By-law.

CHAPTER II.—THE COUNCIL

Meetings and Rules of Procedure

1. The Council shall meet on the second Monday of March, May, July, September and November in each year, and on such other days as may be necessary for the despatch of business: Provided that if the Monday so specified for the regular meeting is a public holiday the Council shall meet on the following Monday. The Council shall have power to adjourn any meeting to a later date.

2. At any time in the interval between such meetings the Chancellor or, in his absence, the Deputy Chancellor or, in the absence of both, the Vice-Chancellor shall have power to call a special meeting for consideration of any urgent business which he may wish to submit to the Council.
3. Upon the written requisition of any five members, the Chancellor or Deputy Chancellor or Vice-Chancellor, or in their absence, the Registrar shall convene a special meeting of the Council to be held within fourteen days after the receipt of the requisition. The written requisition shall set forth the objects for which the meeting is required.

4. Except in the case of a special meeting as aforesaid or unless otherwise decided by the Council no motion initiating any subject for discussion shall be made except in pursuance of notice given to the Secretary to the Council at any time not less than ten clear days before the meeting of the Council at which the motion is to be moved, and the Secretary shall enter all such notices in the Notice of Motion Book in the order in which they are received by him.

5. The Secretary to the Council shall transmit by post or deliver to each member of the Council a written or printed notice of the date of the next ensuing meeting of the Council, whether such meeting is an ordinary or special meeting. Such notice shall, except in any case of emergency, be so posted or delivered at least seven days previous to the meeting. Except in any case of emergency all matters to be considered at the meeting shall be stated in the said notice or in a supplementary notice transmitted by post or delivered to each member of the Council not less than three days before the meeting. The said notice or supplementary notice shall be accompanied by supporting statements in sufficient detail to allow members to consider the matters prior to the meeting.

6. In the event of a quorum of the Council not being present at any meeting within half-an-hour after the time appointed for the meeting, whether such meeting is an ordinary or special meeting, the members then present may appoint any convenient future day, of which at least seven days' notice shall be given by the Secretary to the members of the Council in the usual way. Such day may be chosen as the day of the next ordinary meeting of the Council and all business which should have been transacted at the meeting lacking a quorum shall take precedence thereat.

7. The Minutes of any preceding meeting of the Council, whether ordinary or special not previously approved as being a true record, shall be circulated to members of the Council prior to the meeting at which they are to be considered. Upon being approved as correct such Minutes shall be signed by the Chairman as being a true record.

Members Representing Principal Faculties

8. The members to be elected pursuant to paragraph (m) of subsection two of section nineteen of the Technical Education and University of New South Wales Act, 1949-1958, shall be elected by the four principal Faculties to be chosen by the Council at its March meeting in 1957 and in every alternate year thereafter.
The election of a member by the members of each of the Faculties so chosen shall be held on such day in June, 1957, and on such day in that month in every alternate year thereafter, as the Council may appoint.

9. At least forty days' notice of the date of election shall be given by notice posted at the University and in such other places as the Council may determine.

10. The Registrar shall, in respect of each Faculty so chosen, prepare a list of electors, comprised of all persons who are members of the Faculty, completed to the last day for receiving nominations for the election, and a copy of the four lists so prepared shall be exhibited at the University during the period from that date to the time of election.

11A. (a) No person shall be a candidate at an election for a Faculty so chosen unless his name has been communicated to the Registrar in writing under the hands of two persons who are members of that Faculty not less than twenty-eight days before the day fixed for the election.

(b) A nomination of a person for election shall contain the written consent of the person to his nomination and shall specify the Faculty to which the nomination relates.

11B. On the expiration of the time for receiving nominations, the Registrar shall cause the name of each person so nominated and the fact of his candidature to be forthwith posted at the University.

11C. Where only one candidate is nominated in respect of a Faculty so chosen the Registrar shall declare the candidate duly elected. Where two or more candidates are nominated in respect of a Faculty so chosen the election for that Faculty shall be by postal ballot.

11D. (a) Where an election for a Faculty is required to be held by postal ballot under By-law 11C of this Chapter the Registrar shall, at least fourteen days before the date fixed for the election, transmit a voting paper to each person whose name appears on the list prepared pursuant to By-law 10 of this Chapter in respect of the Faculty, addressed to the last known address of the person as noted in the records of the Registrar. Each voting paper shall be accompanied by an envelope marked “voting paper” and by a second envelope addressed to the Registrar on the inside of which shall be printed a form of declaration to be signed by the voter stating that he is a member of the Faculty in respect of which the election is being held.

The envelopes addressed to the Registrar shall be numbered in consecutive numerical order and the number appearing on such an envelope sent to each person shall be entered on the list referred to in the foregoing provisions of this paragraph prepared by the Registrar opposite the name of the person to whom such envelope is sent.
(b) The provisions of paragraphs (b), (c), (d), (e) and (g) of By-law twenty-one of this Chapter shall apply to and in respect of any such election for a Faculty so chosen.

(c) The method of counting votes to ascertain the result of any such election for a Faculty so chosen shall be as prescribed in By-law twenty-nine of this Chapter.

**Member Representing Teaching Staff**

12. The member to be elected pursuant to paragraph (k) of subsection two of section nineteen of the Technical Education and University of New South Wales Act, 1949-1958, shall be elected by the Professors, persons giving full-time instruction within the University and such other persons giving instruction within the University as the Council may determine by resolution from time to time. The election shall be held on such day in the month of June in 1953 and in every alternate year after 1953, as the Council may appoint.

13. At least forty days' notice of the date of election shall be given by notice posted at the University and in such other place as the Council may determine.

14. The Registrar shall prepare a list of electors comprised of all persons eligible to vote as provided under By-law 12 of this chapter, completed to the last day for receiving nominations for any election, and a copy of such list shall be exhibited at the University during the period from that date to the time of election.

14a. (a) No person shall be eligible for election unless his name has been communicated to the Registrar in writing under the hands of two qualified voters not less than twenty-eight days before the day fixed for the election.

(b) Every nomination of the person for election shall contain the written consent of such person to his nomination.

14b. On the expiration of the time for receiving nominations, the Registrar shall cause the name of each person so nominated and the fact of his candidature to be forthwith posted at the University.

14c. In the case of there being only one nomination the Registrar shall declare the candidate duly elected. If there are two or more candidates, the election shall be by postal ballot.

14d. (a) At least fourteen days before the date fixed for the election the Registrar shall transmit a voting paper through the post to each person eligible to vote, addressed to the last known address of the person as noted in the records of the Registrar. Each voting paper shall be accompanied by an envelope marked “voting paper” and by a second envelope addressed to the Registrar on the
inside of which shall be printed a form of declaration to be signed by the voter stating that he is a person qualified under the provisions of By-law 12 of this Chapter to vote at the election of a member of Council to represent the teaching staff.

The envelopes addressed to the Registrar shall be numbered in consecutive numerical order and the number appearing on such an envelope sent to each person eligible to vote shall be entered on the list of electors prepared by the Registrar opposite the name of the person to whom such envelope is sent.

(b) The provisions of paragraphs (b), (c), (d), (e) and (g) of By-law twenty-one of this Chapter shall apply to and in respect of any such election.

(c) The method of counting votes to ascertain the result of the election shall be as prescribed in By-law twenty-nine of this Chapter.

Members Elected by Graduates

15. The members to be elected pursuant to paragraph (j) of subsection two of section nineteen of the Technical Education and University of New South Wales Act, 1949-1958, shall be elected in May in 1953 and in every alternate year thereafter.

The election shall be held on such day in that month as the Council may appoint.

16. At least sixty days' notice of the day of election shall be given by advertisement in two or more of the daily newspapers published in Sydney, and by notice posted at the University.

17. The Registrar shall prepare a list of electors comprised of all graduates of the University, completed to the last day for receiving nominations for any election, and a copy of such list shall be exhibited at the University during the period from that date to the time of election.

18. (i) No person shall be eligible for election—

(a) unless he is a graduate of the University and of the full age of twenty-one years; and

(b) unless his name has been communicated to the Registrar in writing under the hands of two qualified voters not less than twenty-eight days before the day fixed for the election;

(c) if he is engaged in duties connected with the University either on the teaching staff or otherwise.

(ii) Every nomination of the person for election shall contain the written consent of such person to his nomination.
19. On the expiration of the time for receiving nominations the Registrar shall cause the name of each person so nominated and the fact of his candidature to be forthwith advertised in two or more of the daily newspapers published in Sydney, and to be posted at the University.

20. If the number of nominations received is equal to or less than the number of candidates to be elected, the Registrar shall declare the candidate or candidates to be duly elected. If the number of candidates exceeds the number to be elected, the election shall be by postal ballot.

21. The election shall be conducted in the following manner:

(a) At least fourteen days before the date fixed for the election the Registrar shall transmit a voting paper through the post to each graduate eligible to vote, addressed to the last known address of the graduate as noted in the records of the Registrar.

Each voting paper shall be accompanied by an envelope marked "voting paper" and by a second envelope addressed to the Registrar on the inside of which shall be printed a form of declaration to be signed by the applicant stating that he is a graduate of the University.

The envelopes addressed to the Registrar shall be numbered in consecutive numerical order, and the number appearing on such an envelope sent to each graduate eligible to vote shall be entered on the list of electors prepared by the Registrar opposite the name of the graduate to whom such envelope is sent.

(b) The voting papers shall contain the names of all duly nominated candidates arranged in alphabetical order. The voter shall record his vote by placing the number "1" opposite the name of the candidate for whom he desires to give his first preference vote, and shall give contingent votes for all the remaining candidates by placing the numbers "2," "3," "4" and so on, as the case may require, opposite the names of such candidates respectively so as to indicate by numerical sequence the order of his preference for them.

(c) Having marked his voting paper and signed the declaration, the voter shall place the voting paper without any other matter in the envelope marked "voting paper," which he shall seal and transmit to the Registrar in the envelope provided for that purpose.

All voting papers so transmitted and received at the University not later than 5 p.m. on the day of the election shall be counted in the ballot.
(d) The ballot shall be conducted by the Registrar who shall be assisted in the counting of votes by scrutineers to be appointed by the Chancellor. Each candidate shall be entitled to nominate one scrutineer.

(e) As soon as practicable after the closing of the poll the Registrar, in the presence of such of the scrutineers as choose to be present, shall proceed to the examination of the voting papers.

(f) The method of counting votes to ascertain the result of the election shall be as prescribed in By-law 29A of this Chapter.

(g) The Registrar shall reject as informal any voting paper upon which the voter has failed to indicate the number of his preference in respect of the name of any candidate: Provided that where there are not more than two candidates a voting paper shall not be informal by reason only of the fact that the voter has recorded his vote by placing the number “1” opposite the name of one candidate and has failed to place the number “2” opposite the name of the other candidate.

**Member Elected by Undergraduates**

22. The member to be elected pursuant to paragraph (i) of subsection two of section nineteen of the Technical Education and University of New South Wales Act, 1949-1958, shall be elected in May in 1950 and in 1951 and in every alternate year after 1951.

The election shall be held on such day in that month as the Council may determine.

23. At least sixty days’ notice of the day of election shall be given by notice posted at the University and in such other places as the Council may determine.

24. (1) No person shall be eligible for election—

(a) (i) at the elections to be held in 1950 and 1951 unless he is a registered student of the University and of the full age of twenty-one years;

(ii) at any subsequent election unless he is a graduate of the University and of the full age of twenty-one years; and

(b) unless his name has been communicated to the Registrar under the hands of two qualified voters not less than twenty-eight days before the day fixed for the election;

(c) if he is engaged on duties connected with the University either on the teaching staff or otherwise.
(2) Every nomination of a person for election shall contain the written consent of such person to his nomination.

25. On the expiration of the time for receiving nominations the Registrar shall cause the name of each person so nominated and the fact of his candidature to be forthwith posted at the University.

26. In the case of there being only one nomination the Registrar shall declare the candidate duly elected. If there are two or more candidates, the election shall be by ballot of qualified voters voting personally.

27. The election shall be conducted in the following manner:

(a) A ballot shall be taken on the day appointed for the election at the University and at such other place as the Council may determine, of which due notice shall be given.

(b) The ballot shall commence at 10 a.m. and close at 9.30 p.m. on the day appointed.

(c) The provisions of paragraphs (b), (d), (e) and (g) of By-law twenty-one of this Chapter shall apply to and in respect of any such election.

(d) The method of counting votes to ascertain the result of the election shall be as prescribed in By-law twenty-nine of this Chapter.

Method of Counting Votes at Elections by Principal Faculties, Teaching Staff and Undergraduates

28. By-law twenty-nine of this Chapter applies to elections by the Principal Faculties, Teaching Staff and Undergraduates.

29. (1) (a) The Registrar shall count the total number of first preference votes given for each candidate.

(b) The candidate who has received the largest number of first preference votes shall, if that number constitutes an absolute majority of votes, be elected.

(c) If no candidate has received an absolute majority of first preference votes, the Registrar shall make a second count.

(d) On the second count the candidate who has received the fewest first preference votes shall be excluded, and each ballot-paper counted to him shall be counted to the candidate next in the order of the voter's preference.

(e) If any candidate then has an absolute majority of votes he shall be declared elected; but if no candidate then has an absolute majority of votes, the process of excluding the candidate who has the fewest votes and counting each of his ballot-papers to
the continuing candidate next in the order of the voter's preference shall be repeated until one candidate has received an absolute majority of votes.

(f) The candidate who has received an absolute majority of votes shall be declared elected.

(2) If on any count two or more candidates have an equal number of votes, and one of them has to be excluded, the Registrar shall determine between them by lot which of them shall be excluded.

(3) In the foregoing provisions of this By-law—

The expression "an absolute majority of votes" means a greater number than one-half of the whole number of ballot-papers counted.

The expression "continuing candidate" means a candidate not already excluded at the count.

The expression "determine by lot" means determine in accordance with the following directions:—The names of the candidates concerned having been written on similar slips of paper, and the slips having been folded so as to prevent identification and mixed and drawn at random, the candidate whose name is first drawn shall be excluded.

(4) Where in the final count under this By-law two candidates have an equal number of votes, the Registrar shall determine between them by lot which of them shall be elected.

In reckoning an absolute majority of votes for the purposes of this By-law, the candidate so elected shall be deemed to have received an additional vote.

In this clause the expression "determine by lot" means determine in accordance with the following directions:—The names of the candidates concerned having been written on similar slips of paper and the slips having been folded so as to prevent identification and mixed and drawn at random, the candidate whose name is first drawn shall be the candidate elected.

Method of Counting Votes at Elections by Graduates

29A. (1) This By-law applies to elections by Graduates.

(2) At the first count the Registrar shall count the total number of first preference votes given for each candidate.

(3) On the second count the candidate who has received the fewest first preference votes shall be excluded and if the number of candidates then remaining in the ballot is greater than the number to be elected, each ballot paper counted to the candidate so excluded shall be counted to the candidate next in the order of the voter's preference.
(4) If after the second count more candidates remain in the ballot than require to be elected, the process of excluding the candidate who has the fewest votes and counting each of his ballot papers to the continuing candidate next in order of the voter’s preference shall be repeated until the number of candidates remaining is equal to the number to be elected.

(5) Where as the result of any exclusion of a candidate pursuant to this By-law the number of candidates remaining in the ballot is equal to the number to be elected, the candidates so remaining shall be declared to be elected.

(6) If on any count two or more candidates have an equal number of votes, and one of them has to be excluded, the Registrar shall determine between them by lot which of them shall be excluded.

(7) In this By-law—

The expression “continuing candidate” means a candidate not already excluded at the count.

The expression “determine by lot” means determine in accordance with the following directions:—The names of the candidates concerned having been written on similar slips of paper, and the slips having been folded so as to prevent identification and mixed and drawn at random, the candidate whose name is first drawn shall be excluded.

CHAPTER III.—THE PROFESSORIAL BOARD

1. The Professors in the several Faculties and such other persons as Council may appoint shall form a Board, to be called the Professorial Board.

2. The members of the Professorial Board shall elect a Chairman at a duly convened meeting to be held in May in 1950 and in 1951 and in May of every alternate year after 1951.

The Chairman shall hold office for a period of two years from the first day of July following the election: Provided that the first Chairman shall hold office for a period of one year from the first day of July following his election.

If the office becomes vacant by death, resignation or otherwise before the expiration of the full term, a successor shall be elected at a duly convened meeting of the Board to be held as soon as conveniently may be, and the Chairman so elected shall hold office during the remainder of his predecessor’s term of office.

3. The Registrar shall, by virtue of his office, be a member of the Professorial Board and shall act as Secretary to the Board.
4. (i) The Professorial Board shall be specially charged with the duty of furthering and co-ordinating the work of Faculties and Departments and of encouraging scholarship and research and of considering the studies and discipline of the University.

The Board shall consider and report upon all matters referred to it by the Council or by the Vice-Chancellor.

(ii) Subject to By-laws and to any resolution of the Council the Board—

(a) may consider and take action upon reports submitted to it by any Faculty;
(b) may refer matters to Faculties for consideration and report;
(c) may appoint internal and external examiners after report from the Faculty or from the Dean of the Faculty concerned;
(d) shall, on the recommendation of the appropriate Faculties, annually prescribe all books and details of subjects for lectures or annual examinations in the University, but in any of these subjects pertaining to more than one Faculty when the recommendations of the Faculties concerned do not coincide, the Professorial Board shall, after further communication with the said Faculties, prescribe such books and details;
(e) may determine the conditions of competition for any post-graduate fellowship, scholarship or prize and make the awards: Provided that any conditions of competition approved by the Board for any post-graduate fellowship, scholarship or prize shall be subject to conditions, if any, with respect thereto made by the founder or donor;
(f) may, after report from the Faculties concerned, decide all questions of admission ad eundem gradum. The Professorial Board may by an absolute majority of its members (provided that the Faculty, if any, concerned concurs by an absolute majority of its members) recommend to the Council that a person who has obtained any degree or diploma in another University or educational establishment be admitted to a Degree in the University of New South Wales without any examination;
(g) may submit recommendations to the Council on the invitation of the Council with respect to the selection of Professors, Lecturers, and other teaching and research staff;
(h) may, after a report of the Faculties concerned, decide all questions of admission with advanced standing. The Professorial Board may by an absolute majority of its members (provided that the Faculty, if any, concerned concurs by an absolute majority of its members) recommend to Council that a person who has completed an approved course of
study in a University or educational establishment approved by the Council be admitted with such advanced standing as may be permitted in each case to a course leading to a Degree of the University of New South Wales;

(i) may perform the duties of a Faculty for all subjects not pertaining to any Faculty and perform any function committed to it by this By-law, although any Faculty or Faculties may have failed to report;

(j) may submit recommendations to Council with respect to any other matter pertaining to academic standards or facilities.

Where the Board does not approve without amendment any recommendation made by a Faculty, the Board shall, if so requested by the Faculty, transmit the recommendation to the Council.

(iii) The Board shall have such other duties and powers as may from time to time be assigned to it by the Council.

(iv) A report of the proceedings of the Board shall be circulated to members of the Council with the notice or supplementary notice of matters to be considered at the meeting of the Council next following that of the Board and shall be laid upon the table of the Council at that meeting.

(v) The Council may at any time of its own motion or at the request of a Faculty review any decision of the Board.

5. (a) The Vice-Chancellor or any member of the Professorial Board may suspend any student from attendance at classes and examinations for breach of discipline or misconduct, and may impose penalties in accordance with academic usage on any student for breach of discipline or misconduct, provided that the circumstances relating to the suspension or fine shall be reported in writing by the member to the Vice-Chancellor forthwith. This By-law shall only extend to breach of discipline or misconduct committed in or with respect to the classes or work of the Department of such member, or committed in his presence.

(b) On reference by the Vice-Chancellor the Board shall investigate matters which involve any question as to breach of discipline or misconduct of any kind by any student or candidate at any University examination and may impose penalties in accordance with academic usage.

(c) Any person affected by a decision of any member of the Professorial Board (other than the Vice-Chancellor) in respect of breach of discipline or misconduct may appeal to the Vice-Chancellor, and in the case of disciplinary action by the Vice-Chancellor, whether on appeal or otherwise, to the Council.
6. (a) The Professorial Board shall meet at the discretion of the Chairman or upon the written request of the Chancellor, or Vice-Chancellor, or of three members of the Board.

(b) Except where otherwise provided by these By-laws, all questions which shall come before a meeting of the Professorial Board at which a quorum is present shall be decided by the majority of members present, and the Chairman shall have a vote, and in the case of an equality of votes, a casting vote.

The number of members who shall constitute a quorum of the Professorial Board shall be the product obtained by multiplying the total number of members of the Board by two-thirds, any fraction in the product being disregarded.

(c) All meetings shall be convened by written notice from the Registrar, specifying the time and place and agenda of the meeting.

CHAPTER IV.—THE FACULTIES

1. (a) The Council may constitute such Faculties as it may deem fit.

(b) Each Faculty so constituted shall consist of the Professors and Associate Professors in the subjects for which the Faculty is responsible and of such lecturers and other persons having appropriate qualifications as the Council may appoint thereto.

(c) The Registrar shall, by virtue of his office, be a member of each Faculty.

2. The Dean appointed to a Faculty pursuant to the Technical Education and University of New South Wales Act, 1949-1958, shall be the Chairman thereof.

3. Each Faculty shall—

(a) supervise the teaching in the subjects with which the Faculty is concerned;

(b) be responsible, with the assistance of such examiners as the Professorial Board may from time to time appoint on the report of the Faculty or of the Dean, for the conduct of examinations in those subjects;

(c) take cognizance of and encourage scholarship and research in those subjects;

(d) consider and report upon all matters referred to it by the Council or by the Vice-Chancellor, or by the Professorial Board.
4. Each Faculty shall consider and report to the Professorial Board upon all matters relating to the studies, lectures, examinations and Degrees of the Faculty.

5. Each Faculty shall have such other duties and powers as may from time to time be assigned to it by the Council.

6. Except where otherwise provided by these By-laws all questions which come before a meeting of a Faculty at which a quorum is present shall be decided by the majority of the members present and the Chairman shall have a vote, and in the case of an equality of votes, a casting vote.

The number of members who shall constitute a quorum of any Faculty shall be the product obtained by multiplying the total number of members (exclusive of members who have been granted leave of absence by the Vice-Chancellor) of that Faculty by two-thirds, any fraction in the product being disregarded.

7. The Chairman of a Faculty shall be the Executive Officer of the Faculty and shall have such other duties and powers as may from time to time be assigned to him by the Council.

8. Each Faculty shall deal with all applications for information and other correspondence on subjects appropriate to such Faculty which may be brought before it by the Dean or by the Registrar.

Chapter V.—Vice-Chancellor

1. The Vice-Chancellor shall, by virtue of his office, be a member of every Board, Faculty and Committee within the University, and may, if he so desires, preside at any meeting of such Board, Faculty or Committee.

Nothing in this By-law shall affect the precedence or authority of the Chancellor or Deputy Chancellor.

Chapter VI.—Honorary Degrees

1. The Council may admit on Honoris Causa to any Degree of Doctor in the University of New South Wales any graduate of another University who is recommended for such admission by an absolute majority of the Professorial Board and by an absolute majority of the Faculty in which the Degree is to be conferred as being a person of distinguished eminence in some branch of learning appropriate to such Faculty.

2. The Council may admit on Honoris Causa to the Degree of Doctor in an appropriate field in the University of New South Wales any person considered by the Council to be distinguished by eminent public service in a particular technical field.
THE UNIVERSITY OF NEW SOUTH WALES

Chancellor

WALLACE CHARLES WURTH, C.M.G., LL.B.

Deputy Chancellor

The Hon. Mr. Justice JOHN SYDNEY JAMES CLANCY, LL.B.

Vice-Chancellor


Pro-Vice-Chancellor


THE COUNCIL

STEPHEN JOHN CHARLES ANGYAL, Ph.D., F.R.A.C.I., Associate Professor of Organic Chemistry, University of New South Wales.


The Hon. John Sydney James Clancy, LL.B., Deputy Chancellor, Justice of the Supreme Court.

HAROLD GRAYDON CONDE, C.M.G., M.I.E.Aust., Chairman, Electricity Commission of New South Wales.

RICHARD ARTHUR CORIN, B.E., Group Engineer, Postmaster-General's Department.

ERIC ALEXANDER DICKSON, F.S.T.C., Acting Director, New South Wales Department of Technical Education.

ROBERT CLARENCE GIBSON, C.M.G., General President, Primary Producers' Union.
The Hon. William McCulloch Gollan, M.L.A.

John William Goodsell, C.M.G., F.A.S.A., President, Metropolitan Water, Sewerage and Drainage Board.

Harry Frederick Heath, B.A., B.Ec., Member, New South Wales Public Service Board.


Allan Robert Johnston, General Secretary, Farmers' and Settlers' Association of New South Wales; General Secretary, Australian Wool and Meat Producers' Federation.

John Patrick Kennedy, B.Sc., General Motors-Holden's Research Fellow, School of Wool Technology.

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Senior Lecturer (Acting)

C. R. B. Quentin, M.A. (Oxon.).
School of Applied Psychology

Professor of Applied Psychology—J. F. Clark, M.A., B.Sc., Dip.Ed. (Syd.), Ph.D. (Lond.).

Senior Lecturers
E. E. Davies, M.A. (Syd.).
O. Porebski, M.A., Ph.D. (Lond.).

Lecturers
W. E. C. Anderson, B.A., Dip.Ed. (Syd.).
A. E. Carey, B.Sc. (Lond.).
A. W. Clark, M.A. (Melb.).
C. P. Kenna, B.A., B.Sc. (Syd.).
J. C. Murray, B.A. (Syd.).
A. K. Olley, B.A. (Syd.).
R. Yensen, M.A. (W. Aust.), Ph.D. (Cantab.).
ADMINISTRATIVE STAFF

VICE-CHANCELLOR


Secretary—Shirley J. McCartney.

PRO-VICE-CHANCELLOR


Registrar

G. L. Macauley, B.Ec. (Syd.).

Bursar

J. O. A. Bourke, B.A. (Syd.).

LIBRARIAN

J. W. Metcalfe, B.A. (Syd.), F.LA.

DIVISION OF THE REGISTRAR

Deputy Registrar

A. J. T. Ford, M.C., B.Ec. (Syd.), A.A.S.A.

Educational Research Section

L. N. Short, M.Sc., Dip.Ed. (Syd.), D.Phil. (Oxon), A.R.A.C.I.

Assistant Registrar and Secretary to Council

J. S. Fraser.

Public Relations Officer

G. Caiger, M.A. (Oxon.).

Publications Section

F. S. Symes, B.A. (Syd.).
P. M. Augimeri, B.A. (Syd.).

Senior Faculty Clerk

K. Barry.

Examinations and Student Records Section

W. H. Leatherdale, B.A. (Melb.).
Veronica Fisher.
SUPERVISOR OF STUDENT AMENITIES
Major R. K. Wilthew.

ASSISTANT SUPERVISOR OF STUDENT AMENITIES
I. R. Cracknell, Dip.Phys.Ed. (Syd.).

DIVISION OF THE BURSAR

BUILDING, PLANNING AND DEVELOPMENT SECTION

ACCOUNTS AND PURCHASING SECTION
J. F. Best (Purchasing Officer).

PERSONNEL SECTION
A. S. Veitch (Senior Clerk).
Valerie M. McCallum (Appointments Officer).
K. M. Gibson (Clerk).

BUILDINGS AND GROUNDS SECTION
G. F. W. Sanders, B.A. (Syd.) (Property Officer).
A. F. J. Watson (Building and Maintenance Foreman).

CATERING MANAGER
M. J. Martin.
TECHNICAL STAFF

Faculty of Science

School of Biological Sciences

Laboratory Manager
P. D. C. Mumby, A.I.S.T., A.R.P.S.

Technical Officers
W. Cygan, Dipl.Ing. (Vienna).
L. Lehoczky, M.D. (Szeg.).
G. G. McPherson, A.I.S.T.
J. P. Stuart.
Frances Wheelhouse.

School of Chemistry

Laboratory Manager

Micro-Analyst
E. Challen, Dr.Ing. (Berl.), A.R.A.C.I.

Technical Officers
N. T. Barker, B.Sc., A.R.A.C.I.
J. H. Bell, A.S.T.C.
Janet C. Johnston, B.Sc. (Syd.).
J. Klavins, A.R.A.C.I.
V. A. Pickles, A.S.T.C., A.R.A.C.I.
L. Rannit, Dip.Chem. (Estonia), A.S.T.C.
I. H. Reece, B.Sc., A.S.T.C.
J. F. Rockwell, A.S.T.C.
V. Shuk, Dipl.Chem. Ing. (Kiev).
N. Sinicins, Dr.Chem. Ing. (Riga).
D. G. Weeden, A.S.T.C.

School of Applied Physics

Technical Officers
J. W. Bolin.
N. Florescu, B.Sc., B.E., D.Phys. (Tassi.).
H. Hofer, Ph.D. (Vienna).
M.I.R.E.
K. Mann, B.Sc. (Qld.).
C. J. Tenukest.
Faculty of Engineering

School of Civil Engineering

Laboratory Manager
R. A. Duncan, A.S.T.C.

Technical Officers
H. J. Audova, B.E.
D. E. Hattersley, A.S.T.C.
F. G. Keller, Dipl.Ing. (Vienna).
H. N. Lunsmann, A.S.T.C.
F. A. J. Stein, B.E.

School of Electrical Engineering

Laboratory Manager
H. G. Phillips.

Technical Officers
G. Choy, B.E.
K. W. Ford, A.S.T.C.
T. M. Park, B.Sc. (Manc.).
N. Sawyer, A.S.T.C.
J. H. Sieuwerts, A.S.T.C.
D. Vasilescu, A.S.T.C.

School of Highway Engineering

Technical Officer
J. Dunlop, A.S.T.C.

School of Mechanical Engineering

Laboratory Manager
G. I. Finkel.

Technical Officers
U. Barda, A.S.T.C.
G. H. Cumming, A.S.T.C.
W. Dollar, A.S.T.C.
P. Dransfield, A.S.T.C.
R. F. Fredericks, Dipl.Ing. (Munich).
E. S. M. McLeod, A.S.T.C.
S. T. Willatt, B.Sc. (W. Aust.).
Faculty of Technology

School of Chemical Engineering

Laboratory Manager
J. R. Gatenby, A.S.T.C.

Technical Officers
R. L. Cotham, A.S.T.C.
W. R. Day, B.Sc., A.S.T.C.
O. Dworjanyn, A.S.T.C.
C. L. Samways, B.Sc. (Syd.).

School of Metallurgy

Technical Officers
J. L. Gordon, A.S.T.C
B. Harris, B.Sc. (Syd.).
J. M. Newburn, A.S.T.C.
A. F. Sievers, A.S.T.C.
N. Standish, A.S.T.C.
J. A. Taylor, A.S.T.C.

School of Mining Engineering and Applied Geology

Technical Officers
T. P. Maher, B.Sc. (Syd.).
G. W. Parsons, A.S.T.C
G. T. See, B.Sc., A.S.T.C.
L. L. Waterhouse, B.E. (Syd.).

School of Textile Technology

Technical Officers
N. Buchsbaum, B.Sc. (Haifa).
T. S. Hickie, A.S.T.C.

School of Wool Technology

Technical Officers
C. A. Graham, B.Sc.
D. B. Hughes, B.Sc.
R. B. Harrington, B.Sc. (Maine), M.S. (Oklahoma).

Faculty of Humanities and Social Sciences

School of Applied Psychology

Technical Officer
S. Bochner, B.A. (Syd.).
NEWCASTLE UNIVERSITY COLLEGE

REGISTRAR—J. F. Foley, B.Ec. (Syd.).

ACADEMIC STAFF

Department of Science

Head of Department of Science
Associate Professor, J. A. Allen, M.Sc. (Qld.), Ph.D. (Bristol), F.R.A.C.I.

School of Applied Physics

Senior Lecturer

Lecturers
K. J. Ausburn, B.Sc. (Syd.), M.Sc. (Lond.), D.I.C.
J. E. Cleary, B.Sc.
J. A. Ramsey, M.Sc. (Melb.).

School of Chemistry

Associate Professor
J. A. Allen, M.Sc. (Qld.), Ph.D. (Bristol), F.R.A.C.I.

Senior Lecturer

Lecturers
G. C. Curthoys, B.Sc. (Syd.), A.R.A.C.I.
H. Duewell, M.Sc. (Syd.), Ph.D. (Cantab.).
E. B. Jacobs, B.Sc. (Syd.).
E. P. A. Sullivan, M.Sc., Ph.D. (Syd.).
H. R. Tietze, M.Sc. (Lond.), A.R.I.C.

School of Mathematics

Senior Lecturer
I. L. Rose, B.E. (Syd.).

Lecturers
J. R. Giles, B.A. (Syd.).
J. A. Lambert, B.Sc. (Syd.).
R. F. Matlak, Ph.Mgr. (Cracow), B.A. (Syd.).
M. Temple, M.A. (Dub.).
Department of Engineering

School of Civil Engineering

Senior Lecturer

Lecturers
W. S. Butcher, B.E. (Syd.), A.M.I.E.Aust.
K. S. Sellick, B.E., A.S.T.C.

School of Electrical Engineering

Senior Lecturer

Lecturers
J. H. Caldwell, B.Sc., B.E. (Syd.).
T. Glucharoff, Dipl.Ing. (Munich), M.E.

School of Mechanical Engineering

Senior Lecturer
A. K. Johnston, B.E. (Syd.), M.S. (Iowa), Ph.D.

Lecturers
L. W. B. Browne, B.E. (Syd.).
M. J. Hallinan, A.S.T.C.

Department of Technology

Head of Department of Technology
Associate Professor E. O. Hall, M.Sc. (N.Z.), Ph.D. (Cantab.), F.Inst.P.

School of Chemical Engineering

Senior Lecturer

Lecturers
W. G. Kirchner, M.Sc., A.S.T.C., M.I.E.Aust., A.R.A.C.I.
J. Roberts, B.Sc.

School of Metallurgy

Associate Professor
Senior Lecturer

Lecturers
G. B. Johnston, B.Sc., A.S.T.C., A.I.M.
J. E. McLennan, A.S.T.C., L.I.M.
N. A. Molloy, B.E. (Qld.).
W. A. Oates, B.Met. (Sheff.).

School of Mining Engineering and Applied Geology

Lecturers
B. A. Engel, B.Sc. (N.E.).
Beryl Nashar, B.Sc., Dip.Ed. (Syd.), Ph.D. (Tas.).
J. H. Rattigan, M.Sc. (Qld.).
A. S. Ritchie, A.S.T.C.

Teaching Fellow
Elizabeth A. Teasdale, B.Sc. (Syd.).

Department of Architecture

School of Architecture and Building

Lecturer
E. C. Parker, A.S.T.C., A.R.A.I.A.

Department of Arts

Head of Department of Arts
Associate Professor J. B. Newton-John, M.A. (Cantab.).

Classics

Senior Lecturer
J. Duhigg, B.A. (Syd.), M.A. (Cantab.).

Lecturers
G. G. Betts, B.A. (Syd.), B.A. (Cantab.).

English

Senior Lecturer
D. C. Muecke, B.A. (Adel.), M.A. (Oxon.).
Lecturers
D. B. O'D. Biggins, B.A. (Lond.), M.A. (So'ton).
Robyn K. Iverach, B.A. (Syd.).
T. H. Jones, M.A. (Wales).

FRENCH
Senior Lecturer

Lecturer
I. P. Barko, Lic.Ph.L. (Brussels), D.de l'U. (Stras.).

Lecteur
M. Caillot, Lic.ès.L. (Lyon).

GEOGRAPHY
Senior Lecturers

Lecturers
M. G. A. Wilson, M.A. (N.Z.)

GERMAN
Associate Professor
J. B. Newton-Jolin, M.A. (Cantab.).

Lecturers
L. Bodi, Ph.D., Dip.Ed. (Bud.).
Marlene J. Norst, B.A., Dip.Ed. (Syd.).

HISTORY
Professor of History
J. J. Auchmuty, M.A., Ph.D. (Dub.), M.R.I.A., F.R.Hist.S., Dean of the Faculty of Humanities and Social Sciences.

Senior Lecturer
G. A. Cranfield, B.A., Ph.D. (Cantab.).
Lecturers
A. H. Anderson, M.A., Ph.D. (Edin.).
J. P. S. Bach, M.A. (Syd.).
T. R. Reese, B.A. (Sheff.), Ph.D. (Lond.).

PHILOSOPHY
Senior Lecturer
A. M. Ritchie, M.A. (Syd.), Ph.D. (Lond.).
Lecturer
A. J. Anderson, B.A. (Syd.).

PSYCHOLOGY
Senior Lecturer
D. R. Martin, B.A., Dip.Ed. (Syd.).
Lecturers
Irene A. Edmonds, M.A. (Syd.).
B. Fenelon, B.A. (Qld.)
A. C. Hall, B.A. (R’dg).
K. H. Star, B.A. (Melb.), Ph.D. (Lond.).

Department of Commerce

Head of Department of Commerce
Associate Professor, C. C. Renwick, M.Ec. (Syd.).

ACCOUNTANCY
Lecturers
B. Colditz, A.A.S.A., A.C.I.S.
R. A. Woodman, LL.B. (Syd.).

ECONOMICS
Associate Professor
C. C. Renwick, M.Ec. (Syd.).
Lecturers
B. L. Johns, M.A. (Cantab.).
P. W. Sherwood, B.Com. (Lond.).
Teaching Fellows
M. Bernasek, B.Ec. (Syd.).
B. Gordon, B.Ec. (Syd.).

TECHNICAL STAFF

School of Chemical Engineering
Technical Officer
W. J. Howarth, A.S.T.C.

School of Chemistry
Technical Officer
W. J. Hay, A.S.T.C.

School of Mechanical Engineering
Technical Officers
D. B. Stewart, A.S.T.C.
H. A. Willems, A.S.T.C.

School of Metallurgy
Technical Officer
J. A. Grahame, A.S.T.C.

WOLLONGONG

Head of University Division—C. A. W. Devitt, B.E. (Syd.), A.M.I.E. Aust.

Schools of Chemistry and Metallurgy
Senior Lecturer
E. Gellert, Ph.D. (Basle).

Lecturers
T. W. Barnes, A.S.T.C., A.I.M.
F. M. Hall, A.S.T.C., A.R.A.C.I.

Technical Officer
R. Rudzats, B.Sc., A.S.T.C., A.R.A.C.I.

School of Electrical Engineering
Senior Lecturer
Lecturer
W. H. Charlton, A.S.T.C., A.M.I.E.E.

School of Mathematics
Lecturer
B. E. Clancy, B.Sc., Dip.Ed. (Syd.).

School of Mechanical Engineering
Senior Lecturer

Lecturers
R. W. Upfold, B.E., A.S.T.C.

Technical Officer
R. M. Kinnell, A.S.T.C.

BROKEN HILL
Head of University Division—J. H. Lithgo, A.S.T.C.

School of Chemistry
Lecturers

Schools of Mathematics and Applied Physics
Lecturer
A. I. Segal, B.Sc. (Melb.).

School of Mechanical Engineering
Lecturer
G. D. Butler, B.E., A.S.T.C.
GENERAL INFORMATION

There are six Faculties in the University, each being responsible under the Professorial Board for the supervision of courses of study given in their respective fields.

The Faculties, and the Schools they comprise, are as follows:

Faculty of Science
Schools of Biological Sciences, Chemistry, Applied Physics, and Mathematics.

Faculty of Engineering

Faculty of Technology
Schools of Chemical Engineering, Metallurgy, Mining Engineering and Applied Geology, Textile Technology, and Wool Technology.

Faculty of Architecture
School of Architecture and Building.

Faculty of Humanities and Social Sciences
Schools of Applied Psychology, Humanities and Social Sciences, and Department of Arts (Newcastle University College).

Faculty of Commerce
Schools of Accountancy, Economics, and Hospital Administration.

THE ACADEMIC YEAR

The academic year is divided into three terms. Each term is of twelve weeks' duration. In the third term classes cease at the close of the tenth week and examinations begin one week later. Vacations, each of two weeks' duration, occur between the first and second terms and between the second and third terms. The dates of commencement and ending of each term are given in the Calendar on pages 5 to 7.

UNDERGRADUATE COURSES OF STUDY

The undergraduate courses of the University are designed to give students a thorough knowledge of the fundamental sciences relative to their particular field of study and to provide a sound training in
the professional subjects of the course and in related subjects in allied professional fields. Students are assisted to develop the art of expression and are required to study certain humanities and social science subjects which should extend the student's understanding of himself and his environment.

Throughout the course close association with industry is maintained on the practical aspects of the profession. This is achieved in most courses by requiring students to complete an approved period of industrial training prior to graduation. The staff at the University will assist students to obtain this employment either as sponsored students or as trainees employed on a temporary basis. Private students may make their own arrangements for industrial training but such employment and training must be of a standard approved by the University. Where reports on industrial experience are required they must be submitted by 31st March following the training period.

The University provides undergraduate courses leading to the degrees of Bachelor of Science, Bachelor of Engineering, Bachelor of Surveying, Bachelor of Architecture, and Bachelor of Commerce.

First Degree Courses

Bachelor of Science.

The degree of Bachelor of Science may be taken by completing courses specialising in Applied Physics, Optometrical Science, Applied Chemistry, Chemical Engineering, Fuel Technology, Industrial Chemistry, Leather Chemistry, Applied Biology, Metallurgy, Food Technology, Textile Technology, Wool Technology, Applied Psychology or Industrial Arts. In addition, students may take a Science course, in which a wide range of electives and various specialisations are offered.

Bachelor of Engineering

The degree of Bachelor of Engineering may be taken by completing courses specialising in Mechanical Engineering, Naval Architecture, Electrical Engineering, Mining Engineering, Applied Geology, Civil Engineering, or Industrial Engineering.

Bachelor of Surveying

A first degree in Surveying is awarded, namely, Bachelor of Surveying.

Bachelor of Architecture

One first degree is awarded in the Faculty of Architecture, the degree of Bachelor of Architecture.
**Bachelor of Commerce**

The degree of Bachelor of Commerce is awarded to students completing specified courses specialising in Accountancy, Economics, Statistics, Industrial Relations, Applied Psychology (Commerce) or Wool Commerce.

**Humanities and Social Sciences**

The Faculty of Humanities and Social Sciences conducts Arts courses at Newcastle University College for the degree of Bachelor of Arts, and provides instruction in Humanities subjects for all undergraduate courses given in the University.

A number of the first degree courses may be taken either by full-time attendance at the University or by part-time attendance concurrently with employment in industry. Details of the alternative courses where they occur are set out in the section of the Calendar headed “Outlines of Courses of Study”.

**Diploma Courses**

By arrangement with the Department of Technical Education the University provides a number of diploma courses leading to the award of the Associateship of Sydney Technical College (A.S.T.C.). Students enrolled in these courses are Registered Students of the University.

Diploma courses are conducted in the following fields:


Details of these courses are published in the Handbook of the Department of Technical Education.

**Conversion Courses for Diplomates of the New South Wales Department of Technical Education**

Associates of the New South Wales Department of Technical Education are given special consideration by the University so as to permit them to pursue their studies in the appropriate degree course with the minimum of repetition or overlap.

The Professorial Board may refuse to accept applications for conversion courses from students who completed their diploma course prior to 1944, and may require such students to enter the normal undergraduate courses with such advanced standing as it
determines. The acceptance of such applicants for entry into conversion courses shall be at the discretion of the Professorial Board.

In all cases, an Associate wishing to proceed to a degree must first make application in writing to the Registrar of the University for a statement of requirements for conversion. Each application is considered individually according to the applicant's academic record and professional experience. Applications for conversion requirements should be made before 31st December of the year prior to that in which the applicant wishes to enter upon the additional studies. This applies equally to students who are completing the final year of their diploma course and are not in possession of the results of their final examinations. The application must set out full details of the applicant's academic and professional career.

Each application will be considered on its merits, but the minimum requirements to qualify for a degree, subsequent to completing a diploma course, are indicated following the outline of the related degree course in later pages of the Calendar.

**Examinations**

In assessing students' progress in the University courses, consideration is given to work in laboratory, and class exercises and any term or other tests given throughout the year, as well as to the annual examination results.

Students are required to attend lectures punctually and diligently, and to complete all practical work prescribed for the year and course in which they are enrolled. In general, no exemptions from subjects or examinations are granted.

No full-time student (except those in the Science course or in the Commerce courses) will be permitted to attend lectures or to sit for examination in any subject in any year until he has passed in all subjects of the previous year, unless special permission has been granted by the faculty in which he is enrolled. Such permission must be applied for, and, if allowed, will be for one subject only in any year. The student must then, during the subsequent year, pass the examination in the subject for which the special permission has been granted. A student availing himself of the provisions of this section will not be eligible for any prizes or scholarships at the annual examinations.

**Higher Degrees and Graduate Courses**

Graduate students may proceed to the degree of Master of Science, Master of Science in Psychology, Master of Engineering, Master of
Technology, Master of Architecture, Master of Hospital Administration, Master of Commerce, or Doctor of Philosophy in Science, Engineering, or Architecture. Conditions for the award of these degrees are set out on pages 119 to 138 of the Calendar.

The degree of Master of Technology is awarded on the successful completion of a course of advanced lectures together with a project. Courses leading to the award of this degree are offered in the Schools of Civil, Traffic and Highway Engineering and details are given later in this Calendar.

Special, short, intensive graduate courses are provided throughout each year designed to keep practising scientists and technologists in touch with the latest developments in their various fields. The programme of such courses for 1959 is advertised separately.

**Fees**

**Payment of Fees**

(a) Fees are payable at the time of enrolment which must be effected not later than the 31st March in any year. Students who are unable to pay the yearly fees may pay by the term in which case re-enrolment must be effected at the beginning of each term.

(b) Any student who enrolls after the third week in any term irrespective of whether he/she is responsible for the payment of his/her fees, shall be charged a late fee of £1. The late fee will be increased to £2 in the case of enrolments effected after 31st March in the first term (where special permission is granted to enrol after this date), 30th June in second term and 30th September in third term.

(c) Any student who is unable to pay fees by the appointed date may apply in writing to the Registrar for an extension of time (a maximum of one month may be permitted) but such applications will not secure exemption from late fees unless lodged before the date on which this fee becomes payable.

**Undergraduate (Diploma, Degree or Conversion) Courses**

(a) Courses other than Arts.

For the purpose of fee determination 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. Where 15 hours or less per week instruction is involved in any term, a part-time course fee will be charged.

(i) Full-time Course Fee—£90 per annum or two payments of £45 per term or three payments of £30 per term, according to number of terms in year.
(ii) Part-time Course Fee—£36 per annum or £12 per term for instruction involving over six hours per week.
£18 per annum or £6 per term for instruction involving three hours to six hours per week.
£9 per annum (no term payment) for instruction involving less than three hours per week.

(b) Arts Courses (Newcastle University College).
(i) Pass—£24 per annum per subject or £8 per term per subject.
(ii) Honours—an additional £9 per annum per subject in which Honours are taken in student's 2nd and 3rd years and £33 per subject per annum in the fourth year.

In addition, all students enrolling for the first time in courses in categories (a) and (b) above and proceeding to a degree will be required to pay a matriculation fee of £3. A graduation fee of £3 is also payable before admission to a degree.

Higher Degrees £

(a) Master of Science,* Engineering,* Architecture, or Commerce.
(i) Qualifying Examination .. .. .. 5
(ii) Registration Fee .. .. .. .. 2
(iii) Internal full-time student annual fee .. .. 30
Internal full-time student term fee .. .. 10
(iv) Internal part-time student annual fee .. .. 15
Internal part-time student term fee .. .. 5
(v) External student annual fee .. .. .. 10
(vi) Final Examination .. .. .. .. 15

(b) Master of Hospital Administration.
(i) Registration Fee .. .. .. .. .. 2
(ii) First Year Fee .. .. .. .. .. 90
(iii) Second Year Fee .. .. .. .. .. 30
(iv) Third Year Fee .. .. .. .. .. 30
(v) Graduation Fee .. .. .. .. .. 3

(c) Master of Technology.
(i) Registration Fee .. .. .. .. .. 2
(ii) Graduation Fee .. .. .. .. .. 3

* Candidates registered under the conditions governing the award of this degree without supervision will pay the following fees: Registration Fee, £2; Examination of Thesis, £30.
(iii) Course Fee—calculated on the basis of a term's attendance at the rate of 30s. per hour per week. Thus the fee for a programme requiring an attendance of 24 hours per week for a term is $24 \times 30s. = \text{£}36$ per term.

(d) Master of Arts (Newcastle University College)
Course Fee—£24 per annum or £8 per term.

(e) Doctor of Philosophy
(i) Qualifying Examination .. .. .. .. 5
(ii) Registration Fee .. .. .. .. 2
(iii) Annual Fee .. .. .. .. 30
(iv) Final Examination .. .. .. .. 21

Research
(a) One day per week—£10 per annum.
(b) Two or three days per week—£20 per annum.
(c) Four or five days per week—£30 per annum.

Deferred Examinations
£2 for each subject.

Students' Union
Annual subscription, £1 5s. (compulsory for all registered students).

Sports Association
Annual subscription, 10s. (compulsory for all registered students).

Newcastle University College Students' Association
Annual Subscription, £2 2s. (compulsory for all registered students of the College).

Enrolment Procedure

First Degree and Diploma Courses

First Enrolments—All students enrolling at the University for the first time, whether in first year or with advanced standing, must enrol through the Guidance Office. Students wishing to enrol in the first year of a course should make application for enrolment as soon
as the results of their qualifying examination (Leaving Certificate, Qualifying, Qualifying (Deferred), or Matriculation examination) are known. Applicants for enrolment with advanced standing are advised to lodge an application as soon as possible and prior to 31st December in the year preceding that in which enrolment is proposed.

*Later Year Enrolments*—All students enrolling other than for the first time should enrol through the appropriate School. Such enrolments should be effected during Enrolment Week at the commencement of the academic year in accordance with the special arrangements made by the individual Schools.

Where students have only paid fees for the first term of any year, it is necessary to re-enrol for the second and third terms at the commencement of those terms; forms for this purpose may be obtained from the appropriate School.

*Conversion Courses*

Enrolment in these courses must commence with an application to the Registrar for admission, and the applicant will be notified of the subsequent procedure.

*Higher Degree Enrolments*

Details of the procedure to be followed in order to enrol for a higher degree are given in the statement of the conditions of award of the various higher degrees as set out on pages 119 to 138 of this Calendar.

**Residence for Students**

Accommodation is available at Kensington for two hundred and seventy-five students in residence. Students desiring residence should apply direct to the Master of the College, Dr. Malcolm Mackay, Box 1, P.O., Kensington.

Students will not be admitted to residence for shorter periods than one academic year. Residence fees are payable one term in advance.

Tutorial assistance for resident students will be available in 1960.
GUIDANCE OFFICE

Services Available

The Guidance Office provides a comprehensive vocational and educational information and counselling service for students and prospective students of the University. In more detail the activities of the office may be indicated under the following headings.

1. Student Counselling

The aim of the counselling service, stated briefly, is to enable the individual to take the fullest advantage of the educational and vocational opportunities available to him.

A prospective student who has not made a definite choice of career may thus consult a guidance officer who will discuss with him his previous educational attainments, assessed abilities and interests in relation to the demands of the many University courses offering, and introduce him to other sources of information and advice.

Each student entering the University is invited to interview a guidance officer to discuss his plans, to put any questions of a general kind about the University or his course, and to review his methods of study. Throughout this course, moreover, the service is freely available if he feels the need of help in adjusting himself to University life; if, for example, his study habits do not meet the demands of University work, if his reading skills are similarly inadequate or if he has a distracting personal problem. Such difficulties though not concerned directly with the subjects being studied can nevertheless have a profound effect upon the student's progress in his course. An appointment may be made personally or by telephone.

2. Educational and Occupational Information Service

Correct and complete information is essential for a proper choice of a vocation or course of training. Closely associated with its counselling activities therefore the Guidance Officer provides information for the public and students in the following and related matters:

(a) Courses of training offered, e.g., types, duration, entrance and occupational requirements, fees and special conditions applicable.

(b) Information concerning financial assistance for students, e.g., scholarships, bursaries, exhibitions.

(c) Occupations, e.g., methods of entry, methods of training, prospects, personal qualifications needed and descriptions of the work. Booklets are available covering many occupations and where necessary arrangements can be made for reference to experts in a particular field for detailed advice.
3. Applications for Variations in Courses

Applications for permission to vary, or to secure special admission to courses laid down in the University Calendar or the Department of Technical Education Handbook, or to defer or resume courses of study, should be made, in the first instance, at the Guidance Office. Where applicable, documentary evidence should be tendered on lodging the application for such a variation. Copies should accompany originals, as this will allow the immediate return of original documents.

4. Service to Students from Overseas

(a) Initial Application for Enrolment—

Students from overseas already resident in New South Wales should enquire initially and in person at the Guidance Office regarding enrolment procedure.

Intending students who have not yet arrived in New South Wales are advised to address their enquiries to the Guidance Officer, University of New South Wales, Broadway, Sydney, clearly stating details of their educational standing, and forwarding certified or photostatic copies of the examination certificates on which they are depending to qualify for matriculation.

(b) Documentary Evidence—

It is desirable that students from overseas seeking admission to, or advanced standing within, a course should bring with them to the Guidance Office documentary evidence of all relevant subjects studied in other countries. This evidence might include diplomas, statements of examinations passed, course syllabuses and samples of examination papers. Original certificates should be produced. If these are in a language other than English, it may be necessary subsequently to secure translations from accredited authorities such as the appropriate consular representative, or the New South Wales Government Interpreter and Translator, Central Court of Petty Sessions, Liverpool Street, Sydney.

(c) English Language Test—

A special examination in the English language is generally required of overseas applicants. In certain cases they may be required to undertake a special English course before, or concurrently with, the main course, and progression in the course may depend on success in this subject. Each person will be advised by the Guidance Officer concerning the requirements in his own particular case, and the student should keep in close touch with the Guidance Office until the English language requirement has been satisfied.
(d) Landing Permits—

The Guidance Office (or the University) is unable to assist in the procurement of "landing permits" for overseas students, who are advised to contact the Australian Commonwealth Government representative in their own country for further advice in this matter.

Location and Hours of Guidance Office

At Sydney the Guidance Office is located at 25 Broadway (ground floor) and is open from 9 a.m. to 9 p.m. daily. Telephone enquiries should be made to M0422, Extension 284. A student counselling service is also provided at Kensington—Telephone FF0351, Extension 462.

At Newcastle the Guidance Office is located at the University College, Tighe's Hill—Telephone MA 0466—after 5 p.m., MA 2077.

Library

A library, servicing courses conducted at Kensington, is situated in the Dalton Building. The library for courses conducted on the Ultimo site is housed in the Sydney Technical College library at the corner of Mews and Thomas Streets, Broadway. Libraries are also provided at Newcastle University College, Tighe's Hill, and in the metropolitan and country technical colleges conducting degree and diploma courses, and all Schools have working collections of books and periodicals for the use of staff.

Each library provides a reference and lending service for staff and students, and is open in term during day and evening sessions.

The Sydney Technical College library includes in its dictionary catalogue entries for publications housed on the Kensington site.

The Students' Union

The Students' Union was formed in 1952 as an organisation, duly recognised by the University Council, to represent the student body and to provide a central organisation for the administration of student activities. In the words of its constitution, "The Union is formed for the purpose of advancing the interests of University men and women, facilitating their general scientific and technical education, and fostering a University spirit among them".

The Union affords a recognised means of communication between the student body and the University authorities, and represents its members in all matters affecting their interests. It aims to promote
the cultural, educational and recreational life of the University and to encourage a permanent interest among graduates in the life and progress of the University.

Membership of the Union is compulsory for all registered students of the University and is open to graduates of the University and to members of its academic staff.

The Union is governed by a Council consisting of student representatives from the various schools of the University, representatives of life members, and of the University and the Sports Association. The Council is elected prior to the Annual General Meeting held in April.

**University Regiment**

The University Regiment is organised as an infantry battalion with an establishment of 35 officers and 805 other ranks. It consists of Battalion Headquarters, Administrative Company (Medical Platoon and Quartermaster Platoon); Support Company (Medium Machine Gun Platoon, Mortar Platoon, Assault Pioneer Platoon, and Signal Platoon); and four Rifle Companies (A, B, C and D), each of three Platoons. D Company is located at Newcastle University College.

The Regiment conducts a 20 day camp each year during January-February, and an additional voluntary camp of 10 days during May, at which a junior leaders course is also conducted. Special classes are held during the year for officers and for potential officers.

Enlistment is voluntary and recruits sign on for a period of two years.

All intending volunteers should arrange an interview with the Adjutant or the Regimental Sergeant Major at Regimental Headquarters, High Street, Kensington, or, in the case of Newcastle students, with the Regular Army instructor attached to D Company.

The University has made available to the Military Authorities an area of ground on the western side of Anzac Parade for the use of the Regiment. Regimental Headquarters and the training depot will shortly be located there in buildings at present being erected by the army.

**Officers**

*Commanding Officer*, Lt. Col. J. McCarty, M.O., E.D.

*2nd in Command*, Major K. L. Kesteven, M.C.

*Adjutant*, Captain F. T. R. Clinghan.
Assistant Adjutant, Lieutenant D. L. Shaw.
Quartermaster, Captain W. W. Ellis.
Regimental Sergeant Major, W/O. V. L. Knight, D.C.M.
Regimental Quartermaster Sergeant, W/O. A. W. S. Shillaker, D.F.C.
O. C. Admin. Company, Captain L. Tolnay.
O. C. “A” Company, Captain M. W. Campbell.
O. C. “B” Company, Captain P. C. Parsonage.
O. C. “C” Company, Captain R. H. Burn.

THE SPORTS ASSOCIATION

In December, 1952, the University Council approved the establishment of the Sports Association as the organisation to control and sponsor sporting activities within the University.

The controlling body of the Association consists of a President, Secretary, Treasurer, eight Vice-Presidents and two delegates from each of the 15 sporting clubs.

A wide range of sporting activities is provided by the various clubs. Membership of the Association is compulsory for all registered students, the annual subscription being 10s.

ACADEMIC DRESS

The details of academic dress worn by graduates of the University of New South Wales, are as follows:

Gowns

Degree of Bachelor—The gown worn by graduates holding the degree of Bachelor of Arts in the University of Oxford or the University of Cambridge.

Degree of Master—The gown worn by graduates holding the degree of Master of Arts in the University of Oxford or the University of Cambridge.

Degree of Doctor of Philosophy—Festal gown of black cloth faced with scarlet cloth to a width of 6 inches.

Cap

Degrees of Bachelor, Master and Doctor of Philosophy—Black cloth trencher cap.
Hoods

Bachelor of Architecture—Hood of black silk lined with white silk and edged with brick-red-coloured silk.

Bachelor of Science—Hood of black silk edged with amber-coloured silk.

Bachelor of Engineering—Hood of black silk edged with light maroon-coloured silk.

Bachelor of Commerce—Hood of black silk edged with cream-coloured silk.

Master of Science—Hood of black silk lined with amber-coloured silk.

Master of Engineering—Hood of black silk lined with light maroon-coloured silk.

Doctor of Philosophy—Hood of scarlet cloth lined with black silk.
REQUIREMENTS FOR ADMISSION

1. A candidate for any degree of the University of New South Wales, must satisfy the conditions for admission set out hereunder before entering upon the prescribed course for a degree.

Candidates who have satisfactorily met the conditions for admission shall be classed as "registered students" of the University after enrolment.

2. (i) Applicants for entry to undergraduate courses leading to a degree may satisfy entrance requirements by passing the New South Wales Leaving Certificate, or equivalent examination, in at least five subjects, of which one must be English and one other must be Mathematics I, or Mathematics II, or General Mathematics, three other subjects being chosen from the following groups, at least one of the three being from Group A:

Group A.—Latin, French, Greek, German, Italian, Hebrew, Chinese, Japanese, Russian, Dutch, Geology, Geography, Agriculture, Economics, Modern History, Ancient History, Combined Physics and Chemistry, Physics, Chemistry, Physiology, Biology, Botany, or Zoology.


(It should be noted that a number of subjects taken for the Leaving Certificate are not approved subjects for admission to the University of New South Wales.)

(ii) General Requirements

The following general provisions apply:

(A) Candidates must meet the requirements set out in section 2 (i) above at one examination provided that—

(a) neither Physics nor Chemistry be taken with the combined subject Physics and Chemistry;

(b) neither Botany nor Zoology be taken with Biology;

(c) neither Botany nor Zoology nor Biology be taken with Physiology;

(d) neither Mathematics I nor Mathematics II be taken with General Mathematics;

(e) a candidate who offers Mathematics and elects to take General Mathematics may not sit for Mathematics I or Mathematics II; a candidate who offers Mathematics and does not elect to take General Mathematics must take both Mathematics I and Mathematics II;
a pass in either Mathematics I or Mathematics II will count as a pass in one subject; a pass in both papers will count as passes in two subjects;

(f) Theory and Practice of Music is accepted only from March, 1946;

(g) Ancient History is accepted only in cases where the pass was obtained at an examination held in 1945 or subsequent years; and further, both Modern History and Ancient History may be offered as qualifying subjects at the examinations held at the end of 1951 and subsequent years;

(h) Agriculture is accepted only in cases where the pass was obtained at an examination held in 1945 or subsequent years;

(i) Economics is accepted only in cases where the pass was obtained at an examination held in 1947 or subsequent years;

(j) Descriptive Geometry and Drawing is acceptable only in cases where the pass was obtained at an examination held in 1954 or subsequent years.

(B) Candidates who have presented themselves for the Leaving Certificate or equivalent examination in five or six subjects selected in accordance with the requirements prescribed in (A) and who have passed in English and a Mathematics and two other of the subjects shall be granted admission provided that they have been awarded "A" passes or passes with Honours in at least three of these four subjects.

[Special Requirements—Part-time Courses]

Students proceeding to a degree by means of a part-time course are required to have reached Leaving Certificate standard in certain subjects before they are permitted to take certain related subjects in the part-time courses. The requirements are as follows:

\[
\begin{align*}
\text{Part-time degree subject.} & \quad \text{Pre-requisite subject at Leaving Certificate, Qualifying, Qualifying (Deferred), Matriculation or equivalent examination.} \\
10.11 \text{ Mathematics} & \quad \text{Mathematics I and Mathematics II.} \\
10.11b \text{ Mathematics} & \quad \text{Physics or Honours at L.C.} \\
1.11 \text{ Physics} & \quad \text{Physics and Chemistry.}
\end{align*}
\]
Part-time degree subject.

2.41 General Chemistry

Pre-requisite subject at Leaving Certificate, Qualifying, Qualifying (Deferred), Matriculation or equivalent examination.

Chemistry or Honours at L.C. examination in combined Physics and Chemistry.

5.101 Engineering Drawing and Materials.
5.11 Engineering Drawing
5.11d Engineering Drawing
5.41 Descriptive Geometry
5.41d Descriptive Geometry

Mathematics II]

(iii) Examinations

Candidates may qualify for entry at the Leaving Certificate Examination held by the Department of Education, or the Matriculation Examination conducted by the University of Sydney, or the Qualifying or Qualifying (Deferred) Examination of the Department of Technical Education.

The Leaving Certificate Examination is usually held in November, and entries must be lodged with the Department of Education during August.

The Matriculation Examination is held in February, and applications must be lodged at the University of Sydney during the first ten days of January except by candidates who have taken the Leaving Certificate Examination in the previous November. The closing date for such candidates will be announced when the Leaving Certificate results are published.

The Qualifying Examination is conducted by the Department of Technical Education in November-December for students attending Qualifying and Matriculation courses conducted by the Department of Technical Education. The Qualifying (Deferred), an open examination, is held in February. Entries must be lodged at the Technical College, Broadway, or other participating Technical Colleges throughout the State for the Qualifying (Deferred) Examination before the middle of January.
Candidates who have satisfactorily met the matriculation requirements of the University of Sydney, but who have not obtained the requisite pass in Mathematics as prescribed for entrance to the University of New South Wales, will be permitted to complete their qualifications to enter the University of New South Wales by passing in Mathematics only, at a subsequent Matriculation, Leaving Certificate, Qualifying or Qualifying (Deferred) Examination.

3. Notwithstanding By-law 2 above, candidates may be accepted as “registered students” of the University of New South Wales under the following conditions, subject to the approval of the Professorial Board:—

(i) Any person who has satisfied the examination requirements for entrance to the diploma courses of the Department of Technical Education, New South Wales, since and including the Qualifying examinations of the Department of Technical Education held at the end of 1940 may be admitted as a “registered student” of the University of New South Wales, but this provision shall not apply to examinations held later than March, 1961.

(ii) 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 of New South Wales, may be admitted to the University of New South Wales as a “registered student” with such status as the Board may determine, provided that, in the opinion of the Board, the applicant’s qualifications are sufficient for entry into the Faculty nominated.

(iii) Persons of other than Australian education may be admitted as “registered students” of the University of New South Wales after examination as directed by the Board, provided they give evidence that satisfies the Board that they are of good fame and character.

(iv) The Board may admit as “registered students” in any Faculty with such status as the Board may determine in the circumstances—

(a) A graduate of any approved University.

(b) An applicant who presents a certificate from any University, showing that he is qualified for entrance to that University, and who, in addition, satisfies the Board that he has met the requirements of the University of New South Wales, 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 ordinary entrance to the nominated Faculty of the University of New South Wales.

4. Any person qualified to enter a degree course in the University of New South Wales in terms of the preceding By-laws shall become a “registered student” of the University of New South Wales after he has signed his name in the student Register in the presence of the Registrar or other person appointed for the purpose by the Council, and has paid the first term fee.

5. (i) The Board may in special cases declare any person qualified to enter a Faculty as a “provisionally registered 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 “registered student”. Students who satisfactorily complete these requirements will be permitted to count the courses so passed as qualifying for degree purposes.

(ii) Persons over the age of twenty-five years may be admitted to provisional status provided that—
(a) they have a meritorious pass at the Leaving Certificate Examination or an equivalent examination and have passed in at least five subjects at such examination, or
(b) they have satisfactorily completed an approved course of systematic study extending over at least three years after passing the Intermediate Certificate Examination, or
(c) they satisfy the Board that they have reached a standard of education sufficient to enable them profitably to pursue the first year of the proposed course.

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

6. Any person desirous of attending lectures at the University of New South Wales may be granted permission to do so by the Board without satisfying the requirements for admission and without being a “registered student,” on payment of such fee as the Council may from time to time direct, but such person shall not necessarily have the privileges of “registered students” and shall not be eligible to proceed to a degree.
SCHOLARSHIPS, BURSARIES, AND CADETSHIPS

Following are particulars of scholarships, bursaries, cadetships, etc., tenable at the University.

In addition to those scholarships made available by the University and other bodies as set out below, a number of industrial organisations and Government Departments sponsor students at the University. Such students generally have their University fees paid by the employer and are employed at cadet rates of pay during their course.

UNDERGRADUATE AWARDS

University Scholarships

The University offers the following scholarships:

(1) For students who have completed Trade Courses (Department of Technical Education.)

Ten scholarships tenable in degree or diploma courses may be awarded annually to students who have completed a trade course and have qualified for admission to a degree or diploma course within three years of the completion of the trade course. The scholarships shall be awarded on the results of the examination qualifying for entrance.

(2) For candidates of the Qualifying Examination (Department of Technical Education.)

Ten scholarships tenable in degree or diploma courses may be awarded annually to students on the results of the Qualifying Examination (Department of Technical Education).

(3) For candidates at the Leaving Certificate Examination.

Fifteen scholarships tenable in degree or diploma courses may be awarded annually on the results of the Leaving Certificate Examination.
The scholarships shall be awarded under the following conditions:

(a) A scholarship holder shall be eligible for enrolment in the course selected and will be exempt from payment of University course fees during the currency of the scholarship.

(b) A student may hold only one scholarship at a time.

(c) The University shall have the power to withhold the award of any scholarship if the applicants are of insufficient merit.

(d) Any scholarship may be withdrawn if the progress or conduct of the holder is unsatisfactory.

(e) The holder of a scholarship in any course of part-time instruction must be actively engaged in the relevant trade or profession for which the course has been established.

(f) A scholarship that has been forfeited or withdrawn may be offered to another candidate.

(g) Only results obtained in the year in which the scholarship competitions are conducted may be considered.

(h) Scholarships available on the Leaving Certificate examination will be awarded in order of merit as shown by the highest aggregate marks in six papers, including those specified for the particular scholarships.

(i) Scholarships available on the Qualifying Examination (Department of Technical Education) will be open only to candidates at the examination who have been bona fide part-time students during the year in which they have taken the examination and shall be awarded in order of merit as shown by the highest aggregate marks in five papers, which shall include those prescribed for enrolment in the course in which the student proposes to enrol.

Applications for these scholarships, on forms obtainable from the Registrar, must be lodged with the Registrar, by 16th January, each year.
Joint Coal Board and Australian Coal Association (Research) Limited Scholarships

The Joint Coal Board and Australian Coal Association (Research) Limited, are each offering scholarships to students who desire to enter the full-time degree courses in Mining Engineering, Mechanical Engineering, Electrical Engineering or Fuel Technology. The scholarships provide for payment of:—

(a) a living allowance;
(b) an allowance of £12 per annum for books;
(c) an allowance of £10 in 1st year for instruments;
(d) obligatory University fees, including course fees, matriculation and graduation fees, Students' Union and Sports Association fees, cost of compulsory geological excursions and annual survey camps provided in the course.

2. Applicants must be medically fit (the Board will arrange for a medical examination). Arrangements also will be made for applicants to visit a colliery before interview by the Selection Committee.

3. Expenses incurred by applicants in attending the medical examination, a vocational guidance test, the visit to a colliery and the interview by the Selection Committee will be met by the Board.

4. The Scholarships will be awarded on the recommendation of a Selection Committee, comprising representatives of the Joint Coal Board, Australian Coal Association (Research) Ltd., the University of Sydney, and the University of New South Wales.

5. Scholarship living allowances will be paid on behalf of the Board and Australian Coal Association (Research) Limited, by the University authorities at the following rates in three payments per year, i.e., at the beginning of each term.

<table>
<thead>
<tr>
<th>Year in Course</th>
<th>If living at home per annum</th>
<th>If living away from home per annum</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>£300</td>
<td>£350</td>
</tr>
<tr>
<td>Second Year</td>
<td>£350</td>
<td>£400</td>
</tr>
<tr>
<td>Third Year</td>
<td>£400</td>
<td>£450</td>
</tr>
<tr>
<td>Fourth Year</td>
<td>£450</td>
<td>£500</td>
</tr>
</tbody>
</table>

6. Scholarship holders will be required to:—

(a) Sign a bond to enter and remain in the New South Wales Coal Industry for one year after graduation as employees of either publicly or privately owned collieries.

(b) Undertake practical experience in selected collieries during the long vacation at the end of first, second and third years.
7. The continuation of the scholarship is subject to the satisfactory progress of the holder, and the donor may terminate or suspend any scholarship if the holder does not continue to make satisfactory progress.

8. Application forms are available from Headmasters of secondary schools in New South Wales, and the Secretary, Joint Coal Board, Box 3842, G.P.O., Sydney. Applications should be forwarded to the Secretary, Joint Coal Board, at the above address not later than 16th January.

Mining and Metallurgical Bursaries Fund

1. The Mining and Metallurgical Bursaries Fund provides for the award of bursaries to students proceeding to a degree in Mining (Metalliferous) or Metallurgy or to the degree of Bachelor of Science with Geology as a major subject. The bursaries are each valued at £30 per annum up to a total value of £90, payable in annual instalments.

2. Candidates must be British subjects and must have completed the first year of their course for the degree of Bachelor of Engineering or Bachelor of Science.

3. The bursaries will be awarded by the Trustees of the Mining and Metallurgical Bursaries Fund, Melbourne, upon the recommendation of a local selection committee, consisting of representatives of the Trustees, the University and the Australasian Institute of Mining and Metallurgy.

4. The selection committee will base its recommendations on considerations of personality and scholarship, and candidates should submit evidence under both these headings. The committee will give chief consideration under the heading of scholarship to proficiency in subjects relating to mining engineering and metallurgy, respectively.

5. No recommendation will be made if, in the opinion of the selection committee, no candidate is qualified.

6. Candidates must lodge their applications and credentials, endorsed “Mining and Metallurgical Bursaries,” with the Registrar of the University on or before 31st December.

7. Payments will be made during the first term of the second, third and fourth years. The payment of the second and third annual instalments of each bursary will be contingent on the holder having completed his second and third years, respectively, and on the decision of the selection committee that he has sufficiently distinguished himself in the subjects of the year.
In general, the attainment of distinction in two subjects or credit in three subjects will be accepted as evidence of sufficient distinction. Special consideration will be given to engineering and geological subjects in the case of a bursary in Mining and to engineering and chemical subjects in the case of a bursary in Metallurgy.

8. Bursars in any year desiring renewal of their bursaries for the following year must apply in writing for such renewal before 31st December.

Commonwealth Scholarships

Students attending first degree or diploma courses at the University of New South Wales are eligible to apply for Commonwealth Scholarships. Open Entrance Scholarships for full-time or part-time study are awarded at matriculation to persons under 25 years of age on 1st January of the year in which the course is commenced. In addition, a limited number of scholarships for full-time or part-time study are awarded to students proceeding to second or later years of their course who have not failed either in the first year or in the year immediately preceding the award of the scholarship, and who have not previously received benefits under the Commonwealth Scholarship Scheme, the Commonwealth Financial Assistance Scheme or the Commonwealth Reconstruction Training Scheme.

Mature Age Scholarships, available only for full-time study, are also awarded, either in the first or later years of a course, to students between the ages of 25 and 30 years on the 1st of January of the year in which a scholarship is awarded, who have resided in Australia for the two years immediately prior to that date, who have no previous professional or tertiary qualifications and who have not previously received assistance under the Commonwealth Scholarship Scheme, the Commonwealth Financial Assistance Scheme or the Commonwealth Reconstruction Training Scheme.

The award of Commonwealth scholarships will be made entirely on merit, and all students awarded Commonwealth scholarships will be entitled to the following benefits, irrespective of the means of their parents:

(a) tuition fees;
(b) examination fees;
(c) degree fees;
(d) general service fees;
(e) other compulsory fees.

Winners of Commonwealth scholarships who undertake full-time courses on a full-time basis may also apply for living allowances, subject to a means test. The maximum living allowances are £221 per annum for a student living with his parents, and £338 per annum for a student living away from his parents.
The maximum living allowances will be granted where the adjusted family income does not exceed £675 per annum. The adjusted family income is the income of the student's parents for the financial year immediately preceding the year in which the scholarship is awarded less £150 for the first dependent child under 16 years of age (other than the applicant) and £75 for each other dependent child under 16 years of age. The amount of living allowance payable abates at the rate of £2 in £10 on the part of the adjusted family income between £675 and £1,350, and at the rate of £3 in £10 on that part of the adjusted income in excess of £1,350. Thus, if the living allowance is to be payable in any particular case the adjusted family income must be less than (i) £1,620 if the student is living at home or (ii) £2,010 if the student is living away from home.

In the case of Mature Age Scholarships the student is also permitted to earn some income from other sources without reduction of the maximum living allowance. A single scholar's permissible income is £2 5s. per week and the permissible income of a married scholar and his/her spouse is £4 10s. per week, with an additional allowance of 9s. a week for one child.

Any scholar may receive from other sources, without deduction from his living allowance, an income of up to £2 a week during short vacations. Income earned during long vacations is not taken into account in determining a scholar's living allowance.

The closing date for applications for Commonwealth scholarships is 30th November of the year immediately preceding the year for which the scholarship is desired. Applications for renewal of Commonwealth Scholarships should be made not later than 30th October. Full particulars and application forms may be obtained from the Officer-in-Charge, University Branch Office, Department of Education, University Grounds, University of Sydney. (Telephone MW 2911.)

New South Wales Public Service Board Traineeships

The N.S.W. Public Service Board awards a number of traineeships in Civil and Mechanical Engineering, Applied Geology, Surveying and Applied Psychology (part-time). Under these traineeships University fees are paid and also allowances at the following rates while the student is in attendance at the University:

1st and 2nd years—
£235 per annum if living at home.
£364 per annum if living away from home.

3rd year—
£282 per annum if living at home.
£420 per annum if living away from home.
4th and subsequent years—

£308 per annum if living at home.
£448 per annum if living away from home.

On reaching the age of 21 years, the trainee receives an allowance at the rate of £336 per annum if living at home or £476 per annum if living away from home.

Married students receive £476 per annum, plus 15s. per week for dependent wife and 10s. per week for each child.

A textbook allowance of £21 per annum is also paid to trainees in full-time courses.

During industrial training periods salaries are paid in accordance with the appropriate agreements.

The Public Service Board also awards traineeships in Applied Psychology, under which fees are paid and trainees are granted 15 hours per week study time during term, the remainder of their time being spent in their departments.

Rates payable during terms are—

Juniors—

Rates ranging from £386 (1st year) to £645 (5th year) if living at home.

Rates ranging from £338 (1st year) to £701 (5th year) if living away from home.

Adults—

Rates ranging from £564 (first three years) to £656 (5th year) if living at home.

Rates ranging from £620 (first three years) to £712 (5th year) if living away from home.

During practical training periods agreement rates are paid.

State Bursaries and Exhibitions

A number of exhibitions and bursaries are awarded by the New South Wales Government on the results of the Leaving Certificate Examination and the Qualifying Examination of the Department of Technical Education. The award of an exhibition exempts the student from payment of fees. Bursaries are awarded subject to the applicant holding an exhibition and satisfying a means test. They are tenable for the duration of one first degree course, and provide a living allowance of £65 per annum (£104 per annum if the student is living away from home), and a book allowance of up to £7 10s. per annum. The permissible income of the applicant's family is
£1,150 if there are three or fewer dependents, with an increase in the permissible family income of £120 for each additional dependent. Bursary holders are allowed to engage in employment only when it is associated with the course, and the income from such employment must not exceed £300 per annum. Further information can be obtained from the Bursary Endowment Board, c/o. Department of Education, Bridge Street, Sydney.

Department of Railways, New South Wales, Scholarships

The Department of Railways, N.S.W., calls applications annually from its employees for scholarships to the degree courses in Applied Chemistry, Metallurgy, and Civil, Mechanical and Electrical Engineering.

The scholarships are available under the following conditions:

Group 1—Cadets and apprentices under 19 years of age as at 31st January in the year in which the scholarships are to be awarded are eligible for consideration.

The applicant must be eligible for enrolment in the complete Stage I of the relevant diploma course and also be acceptable to the University as a student of a degree course.

Group 2—Cadets and apprentices or employees with previous training as cadets or apprentices, who are not over 23 years of age as at 31st January in the year in which the scholarships are to be awarded, who have completed Stages 1 and 2 of the relevant diploma course without post examinations and who obtain credit passes in the principal subjects of Stage 2 in the year prior to the award.

Group 3—Employees who have had at least one year's service, who are not over 25 years of age as at 31st January in the year in which the scholarships are to be awarded, who have completed the relevant Diploma course in the Honours or Credit grade, and who have the necessary qualifications for entry to the degree course.

General—Scholarship holders will have all fees paid, be paid full salary while at the University, retain all benefits as an employee of the Commissioner for Railways, and will be required to complete a bond with surety to cover the period of training and to remain in the Commissioner's service after completion of the training period for five years in the case of Group 3, and ten years in the case of Groups 1 and 2.

The John Heine Memorial Scholarship

The Scholarship is awarded annually at the discretion of the Directors of the John Heine Memorial Foundation, and is designed to encourage the recipient to undertake either the final two years of
the degree course or the conversion course in Mechanical, Electrical, or Chemical Engineering, Applied Chemistry, or Metallurgy. Applicants for the scholarship will be required to furnish evidence of being qualified for admission to the third year of the degree course (fourth year in the case of Chemical Engineering) or to the appropriate conversion course.

The Scholarship has a total value of £250, which is paid at the following rates:

(i) Final two years of the degree courses—
   First year of tenure £100
   Second year of tenure £150

(ii) Conversion courses—
   (a) Mechanical and Electrical Engineering—
       One part-time year followed by one full-time year—£50 in the first year and £200 in the second year.
       Three part-time years—£50 in each of the first and second years, £150 in the third year.
   (b) Applied Chemistry, Chemical Engineering, and Metallurgy—
       Two part-time years—£100 in the first year and £150 in the second year.
       One full-time year, £250.
       One part-time year, £150.

A maximum of £150 is payable to any student completing the requirements for a degree in one year of part-time study only.

Applicants for the scholarship are required to furnish evidence of good character, personality and address and medical fitness. They must also be an employee of a member of the Metal Trades Employers' Association. The tenure of the scholarship is conditional upon satisfactory report as to the recipient's progress in the course being made by the appropriate University authorities.

Application should be made not later than the 31st January of each year to the Secretary, The John Heine Memorial Foundation, c/o the Metal Trades Employers' Association, 7 Wynyard Street, Sydney.

The A. E. Goodwin Memorial Scholarship

The Directors of A. E. Goodwin Ltd. have made provision for the annual award of a scholarship in commemoration of the late A. E. Goodwin.

1. The scholarship shall be known as the A. E. Goodwin Memorial Scholarship.
2. The scholarship shall be open for award each year to students who are eligible to enrol in the second year of the Mechanical Engineering degree course, and, in making the award, consideration shall be given to scholarship, personality and aptitude for the engineering profession.

3. The total value of the scholarship shall be £90, payable in three equal amounts of £30 each at the beginning of the second, third and fourth years of the course.

4. Continued tenure of the scholarship shall be subject to satisfactory progress on the part of the holder.

5. Applications shall be made to the Registrar by 31st January in each year.

**Undergraduate Scholarships in Textile Technology**

The textile industry has undertaken to provide a number of scholarships tenable at the University of New South Wales for students wishing to enrol in courses leading to the degree of Bachelor of Science (Pass and Honours) in Textile Technology.

The companies listed below have made this possible.

Bradford Cotton Mills Ltd.
Bond's Industries Ltd.
Davies Coop (N.S.W.) Pty. Ltd.
Felt and Textiles of Australia Ltd.
John Vicars and Co. Ltd.
W. D. Scott and Co. Pty. Ltd.
Swiss Textile Machine Industries.

The following conditions apply to the scholarships—

1. Each scholarship shall be known as "The ......... Scholarship in Textile Technology", the name of the company donating it to be inserted.

2. Each scholarship shall have a value of £500 per annum from which University fees will be deducted, the balance being payable to the scholar in fortnightly installments as a living allowance. The scholarships will normally be tenable for four years.

3. A scholar's tenure shall at all times be subject to the Professorial Board being satisfied with the progress of the student in his course.

4. Applications for the scholarship on forms obtainable from the Registrar must be lodged with the Registrar by 16th January each year.
(5) The scholarships shall be awarded by the Professorial Board in its absolute discretion following upon the report of a selection committee comprising representatives of each of the donor companies, the Dean of the Faculty of Technology (as Chairman), the Head of the School of Textile Technology, the University Guidance Officer and the Registrar.

(6) If in any one year an insufficient number of suitable candidates apply for the scholarships offered, then those scholarships not awarded will be awarded in subsequent years.

Undergraduate Scholarships in Food Technology

A number of firms in the food processing industries have contributed to provide scholarships for students proceeding to a first degree in Food Technology. The following conditions apply:

(1) (a) Where a scholarship is donated by one company, the scholarship shall be known as the ................. Scholarship in Food Technology; the name of the company donating it to be inserted.

(b) Where the scholarship is provided by donations from a number of different firms, it will be known as a Food Processing Industries Scholarship.

(2) The scholarship shall have a value of £400 per annum payable in fortnightly instalments as a living allowance to a registered student enrolled in the Food Technology degree course, during the years when that course requires full-time attendance at the University.

(3) The Scholarship shall be tenable at the University of New South Wales for a period of one year, but may be renewed for an additional year or years provided that the holder complies with the conditions of the scholarship.

(4) The scholar's tenure shall at all times be subject to satisfactory progress in his course.

(5) Candidates for the scholarship shall be not more than 22 years of age on 1st December in the year preceding that in which the course of study under the scholarship will commence.

(6) No candidate for the scholarship shall be rendered ineligible by reason of his holding any other scholarship.

(7) The scholarship shall be awarded by the Professorial Board on the recommendation of a committee comprising the Dean of the Faculty of Technology, the Head of the Department of Food Technology, a representative of the firm or firms concerned and the Registrar.
(8) In awarding the scholarship, the academic merit and personality of the applicant will be taken into account.

(9) If in any year, in the opinion of the Professorial Board, no candidate is adjudged to be of sufficient merit for the award of the scholarship, no award shall be made.

(10) Applications for the scholarship shall be lodged with the Registrar by 16th January.

Wool Industry Fund Scholarships

The following scholarships financed from the Wool Industry Fund established by the Commonwealth Government are awarded annually—

(a) two scholarships in the degree course in Wool Technology each tenable for four years, continued tenure being subject to satisfactory progress;

(b) two scholarships in Textile Technology, each tenable for four years, subject to satisfactory progress, in any one of the degree courses in Textile Chemistry, Textile Physics, Textile Engineering or Textile Manufacture.

The value of these scholarships is as follows—

<table>
<thead>
<tr>
<th>Basic Rate.</th>
<th>Plus Allowances.</th>
<th>Total Value.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fees.</td>
<td>Books.</td>
</tr>
<tr>
<td>1st year £250</td>
<td>£90</td>
<td>£12</td>
</tr>
<tr>
<td>2nd year £275</td>
<td>£90</td>
<td>£12</td>
</tr>
<tr>
<td>3rd year £300</td>
<td>£90</td>
<td>£12</td>
</tr>
<tr>
<td>4th year £350</td>
<td>£90</td>
<td>£12</td>
</tr>
</tbody>
</table>

It is intended that the holders of these scholarships should on the completion of their courses take up an appropriate occupation in the Sheep or Wool Industry.

Applications will be reviewed by a Committee consisting of the Vice-Chancellor of the University or his nominee, the Professor either of Wool Technology or Textile Technology, as the case may be, a senior representative of the Commonwealth Scientific and Industrial Research Organisation and a representative of either the Wool Producing or the Wool Textile Industry, whichever is applicable.

Applications should be lodged with the Registrar not later than 16th January.
Undergraduate Scholarships in Wool Technology

Firms associated with the wool industry have contributed to provide scholarships for students proceeding to the degree of Bachelor of Science in Wool Technology.

The companies listed below have made this possible—

Elliotts (D.H.A. Rural Division).

William Cooper & Nephews (Australia) Pty. Limited.

Lister Blackstone Pty. Ltd. and its Australian Distributors.

The following conditions apply to the scholarships:—

(1) (a) Where a scholarship is donated by one company, the name of the scholarship shall be determined by the donor company.

(b) Where the scholarship is provided by donations from various sources, it will be known as a “Wool Industry Undergraduate Scholarship in Wool Technology”.

(2) Each scholarship shall have a value of £500 per annum from which University fees will be deducted, the balance being payable to the scholar in fortnightly instalments as a living allowance. The scholarships will normally be tenable for four years.

(3) A scholar’s tenure shall at all times be subject to the Professorial Board being satisfied with the progress of the student in his course.

(4) The scholarship shall be awarded by the Professorial Board on the recommendation of a committee comprising the Dean of the Faculty of Technology, the Head of the School of Wool Technology, a representative of the company or companies concerned and the Registrar.

(5) In awarding the scholarship, the academic merit and personality of the applicant will be taken into account.

(6) If in any one year an insufficient number of suitable candidates apply for the scholarships offered, then those scholarships not awarded will be awarded in subsequent years.

(7) Applications for the scholarship on forms obtainable from the Registrar must be lodged with the Registrar by 16th January each year.
Commonwealth Public Service Cadetships

The Commonwealth Public Service each year offers cadetships tenable in certain undergraduate courses at the University in order to enable selected employees in its service to obtain professional qualifications. During the training period the cadet receives the following salary:

- Under 17 years: £410 p.a.
- At 17 years: £480 p.a.
- At 18 years: £553 p.a.
- At 19 years: £626 p.a.
- At 20 years: £700 p.a.
- At 21 years: £773 p.a.
- At 22 years: £818 p.a.
- At 23 years: £863 p.a.
- Rising by two increments of £45 p.a. to £953 p.a.

Fees are refunded to the cadet on a proportionate basis according to his salary: a full refund is given up to and including the £700 p.a. salary rate, a 75 per cent refund in the range £773 to £818 p.a., a 50 per cent refund on £863 p.a., and a 25 per cent refund thereafter.

Applicants must have passed the Leaving Certificate or equivalent examination with passes in English, Mathematics, and Physics, and they will be required to enter into a bond undertaking to remain in the Commonwealth Public Service for a period of five years after graduation. Either full-time or part-time courses may be undertaken if available.

Cadetships are available from time to time in the fields of engineering, biochemistry, surveying, drafting and architecture.

Details of vacancies at any one time may be obtained from the Employment Officer, Commonwealth Public Service Inspector's Office, 119 Phillip Street, Sydney (Telephone BW5701).

The Australian Atomic Energy Commission Undergraduate Scholarships

The Australian Atomic Energy Commission from time to time invites applications for undergraduate scholarships in fields of importance in Australia's programme of atomic energy development and application. The scholarships are open to students enrolled, or about to be enrolled, in any year of an approved course of study leading to a degree in science or engineering.

Further information concerning the undergraduate scholarships may be obtained from the Secretary, Australian Atomic Energy Commission, Box 5343, G.P.O., Sydney.
Appointment of University Students to Commissions in the Australian Regular Army

A student who is eligible for entry to at least the second year of a full-time course in engineering (civil, mining, electrical or mechanical) architecture or science (prescribed subjects) may be appointed to the Regular Army for the remaining period of his course and granted a commission as an officer after graduation. During the period of their studies successful applicants will have most of their fees (including all lecture fees) paid by the Army and, depending on the stage reached in their course, will receive a salary within the following ranges:—Single, £11 3s. 5d. to £14 19s. 10d.; Married, £13 1s. 11d. to £16 18s. 4d. There are no military duties which would interfere with studies or normal student activities and obligations. Commissions granted will be in the Royal Australian Engineers, Royal Australian Signals or Royal Australian Electrical and Mechanical Engineers.

Graduates in engineering (civil, mining, electrical and mechanical) and in architecture may be granted regular commissions in the Royal Australian Engineers or the Royal Australian Electrical and Mechanical Engineers.

Applications should be made to Headquarters Eastern Command, Victoria Barracks, Paddington (Telephone FA0455, Ext. 478).
POSTGRADUATE AWARDS

The Imperial Chemical Industries of Australia and New Zealand Research Fellowship

Imperial Chemical Industries of Australia and New Zealand has undertaken to provide a sum of £1,100 annually to establish a Fellowship to be known as the Imperial Chemical Industries of Australia and New Zealand Research Fellowship. The following conditions apply to the award:

1. The Research Fellowship is to be used to promote knowledge in those fields which have some direct relation to the scientific interests and national responsibilities of ICIAZN, such as pure and applied chemistry, biochemistry, agricultural science, chemotherapy, pharmacology, physics, engineering, mining and metallurgy.

2. The appointment to a Fellowship is to be made by the University subject to agreement by ICIAZN and is to be open to any subject of a nation in the British Commonwealth who is a graduate of a recognised University.

3. The normal period of tenure will be two years.

4. A Fellow may be permitted to undertake teaching duties within the University, in addition to the research activities for which the Fellowship is granted.

5. A Fellow will not be under any obligation to take out a higher degree.

6. It is intended that the grant should increase the output of research and not be used to relieve the burden on any other source of revenue.

7. The annual grant to the University is fixed at £1,100.

8. Where no suitable candidate applies in any year, the University may carry the grant forward.

9. Application should be made to the Registrar by 30th November, in 1958, and each alternate year thereafter.

Consolidated Zinc Metallurgical Research Scholarship

One post-graduate Metallurgical research scholarship is awarded annually by Consolidated Zinc Proprietary Limited to graduates in metallurgy. The scholarship is of an annual value of £600, and has a maximum tenure of three years. The conditions of award are as follows:

1. The scholarship is open to graduates in metallurgy of a recognised University.
2. Applications close on 9th January, and should be lodged with the Company at 53 Flemington Road, North Melbourne.

3. Applicants must state their age, marital status, and previous academic and practical experience.

4. The subject of the research must be described by the applicant, together with a short statement of the objects towards which the research is directed. It is intended that the research should have some bearing on the industry with which the Company is associated.

5. The suggested research must also be acceptable to the University for submission as a thesis towards a higher degree, and the applicant must reach agreement with the University to this effect before lodging his application with the Company.

6. Final choice of a selected applicant will be made by the Chairman of the Company acting on the recommendation of a chosen official or officials of the Company.

Services Canteens Trust Fund Post-Graduate Scholarship

The Trustees of the Services Canteens Trust Fund offer annually one post-graduate scholarship for study or research in Australia in any field of knowledge prescribed by the University concerned to an outstanding student whose father or mother served in the Australian Forces during the 1939-45 war.

The scholarship shall be valued at £600 per annum and shall be available for a period of up to three years.

The scholarship is open to a child (including step-child, adopted child or ex-nuptial child) of a person who was at any time between 3rd September, 1939, and 30th June, 1947—

(a) a member of the Naval, Military or Air Forces of the Commonwealth; or

(b) a member of any nursing service or women's service attached or auxiliary to any branch of the Defence Force of the Commonwealth; including

(c) members of the Canteens Staff of any ship of the Royal Australian Navy, and any person duly accredited to any part of the Defence Force who served in an official capacity on full-time paid duty.

In awarding the scholarship the Trustees will take into account: (i) Academic career of the applicant. (ii) Ability for research work. (iii) Character. (iv) The future value to Australia of the subject of research selected.
The Scholarship will only be awarded if there is a candidate of sufficient merit.

The scholar must not take paid employment or accept remuneration without the express approval of the Trustees, and must submit to the Trustees at the end of each term reports and a certificate of supervision by the Supervisor of his research, as to the progress of his studies.

Applications must be lodged with the General Secretary, Services Canteens Trust Fund, Victoria Barracks, St. Kilda Road, Melbourne, before 10th January.

Application forms and any further information may be obtained from the Regional Secretary, Services Canteens Trust Fund, 84 Pitt Street, Sydney.

*The Australian Atomic Energy Commission Post-graduate Research Studentships*

The Australian Atomic Energy Commission awards studentships tenable at the University of New South Wales to suitable University graduates desiring to undertake research work within fields of importance to Australia's programme of atomic energy research, development and application such as applied physics, chemistry, chemical engineering, electrical engineering, mechanical engineering or metallurgy. The Studentship is usually awarded to a graduate working for a Ph.D. degree, and is of one year's duration, but may be renewed at the discretion of the Commission for a second or third year.

The Studentships have an annual value of at least £700 per annum, and the Commission also meets all compulsory University tuition fees except those fees payable for enrolment and for the actual taking out of a degree. The Commission may also, upon request by the University, provide funds for the purchase of equipment or materials that would materially assist the student's programme of research.

At the end of each year the student is required to submit to the Commission a technical report on the progress of his work. The student is expected to devote the whole of his time to training in research, except for customary vacations. He may be permitted to undertake limited teaching or demonstrating duties, but he must inform the Commission of the extent of such activities and the income therefrom.

Award of the Studentship is made on the nomination of the University, and applicants should in the first place consult the Head of the appropriate School with a view to securing such nomination.
The General Motors-Holden’s Post-graduate Research Fellowships

General Motors-Holden’s Limited have agreed to provide annually twenty-five post-graduate research fellowships tenable in Australian universities with the objects of:

(i) increasing the number of highly qualified people in Australia, and

(ii) encouraging the development of research facilities in the Australian universities, so that the community may benefit from the efforts of those capable of contributing to its progress.

Two of the Fellowships are tenable in the University of New South Wales, five are reserved for allocation by the Australian Vice-Chancellors’ Committee and the remainder are tenable in the other Australian universities.

The following regulations will apply:

(1) The Fellowships shall be known as The General Motors-Holden’s Post-graduate Research Fellowships.

(2) Each Fellowship is intended to provide for tuition fees, a living allowance and other expenses incidental to post-graduate study and will range in value from a minimum of £800 per annum to a maximum of £1,200 per annum, as recommended by the University.

The Company will, in addition, provide the University with unrestricted grants-in-aid of £300 for each Fellowship. This amount will be allotted to the School in which the Fellow will work or may be expended in such other way as the Vice-Chancellor may determine.

(3) The awards shall be made by the Professorial Board on the recommendation of the Research and Graduate Studies Committee. If less than the number of Fellowships available to the University is awarded in any year, the Australian Vice-Chancellors’ Committee shall be informed. If after the full number of Fellowships available to the University has been awarded there are still applicants considered worthy of an award, the applications of such candidates shall be forwarded with a recommendation to the Australian Vice-Chancellors’ Committee to be considered for the award of a Fellowship from the reserve allocated by the Australian Vice-Chancellors’ Committee.

(4) The Fellowships shall normally be tenable for one year. Where the graduate course undertaken is of longer duration than one year the Fellowship holders may make application
for a renewal of their Fellowships. Such applications for renewal will be dealt with as new applications for the purpose of competition with other applicants for fellowships in that year. Under no circumstances will a holder be considered for more than two renewals of his fellowship.

The tenure of the Fellowship will commence and terminate on dates determined by the University.

(5) Graduates in all faculties may apply but, other things being equal, preference may be given to applicants who have graduated in Engineering, Science, Commerce or Economics and who intend to follow careers in industry or teaching on completion of their Fellowships.

In awarding the Fellowships, qualities of leadership of the candidates, as well as outstanding academic achievements will be taken into consideration.

(6) The Company may, from time to time, inform the universities of specific research projects which are of interest to the Company; however, the Universities will have full responsibility for selecting such research projects and for the assignment of these to Fellowship recipients.

(7) Applications (in triplicate) on forms obtainable from the Registrar must be lodged with the Registrar by 30th November each year.

(8) Fellowships available to but not awarded by the University of New South Wales in any year will be added to the number of the reserve allocated to the Australian Vice-Chancellors' Committee and may be awarded by that Committee accordingly.

Atmospheric Pollution Research Fellowships

Two Fellowships for research on atmospheric pollution, having an annual value of £1,000—£1,300 each, are available to graduates or diplomates in science or chemical engineering. The Fellowships are financed from a grant by a group of governmental and private industrial undertakings.

The conditions of award are as follows:—

(1) The Fellowships are to be known as the Atmospheric Pollution Research Fellowships.

(2) The objectives of the research on air pollution shall be to investigate the nature, source and distribution of substances causing atmospheric pollution in New South Wales, and to assess the ill effects of atmospheric pollution on public health and property.
(3) The Fellowships shall have an annual value of £1,000—£1,300 each.

(4) Candidates for the Fellowships should possess a degree or diploma (preferably with honours) in science or chemical engineering, or have at least equivalent qualifications.

(5) The Fellowships shall be tenable for a period of one year but may be re-awarded for a second or third year. The tenure of a Fellowship shall be subject to the Fellow's work being satisfactory to the Professor under whose direction the work is being conducted.

(6) Subject to University approval, the research may be undertaken as work towards a higher degree.

(7) The Fellows are required to devote their full time to the research and to submit during June and December of each year a full technical report on the research carried out.

(8) Application shall be made to the Registrar by 31st December for Fellowships tenable in the following year.

Commonwealth Post-Graduate Awards

The Commonwealth Government is providing each year a number of awards for post-graduate study and research tenable in the Australian Universities. One hundred of these awards will be available in 1959. Eighty of these have been allocated for award by the Universities, this University having an allocation of twelve. The remaining twenty places are reserved for award by the Australian Vice-Chancellors' Committee to outstanding applicants who have been precluded from selection because the quota allocated to the University concerned has been filled.

The value of the award in this University will, within the limits of £700—£900, be determined by the University having regard to the qualifications of the applicant and the nature of the research or study to be undertaken. The awards will be tenable for one year but may be extended for a longer period provided the maximum duration is not more than four years.

Persons domiciled in Australia who are University graduates or will graduate in the current academic year are eligible for the awards.

Applications for awards tenable in this University must be lodged with the Registrar by 30th November each year.
British Passenger Lines' Free Passage Scheme

The Member Lines of the Australian and New Zealand Passenger Conference provide annually twenty-five first-class return passages to graduates of Australian Universities proceeding to Europe to further their studies. The passages are available by vessels leaving Australia between 1st July and 31st December each year and from the United Kingdom by vessels leaving between 1st March and 30th June. The regulations for the award of free passages are as follows:

1. Passages will be awarded only to graduates who satisfy the selection committee that they will have sufficient funds to enable them to devote their whole time abroad to study and research and give an undertaking to do so.

2. Except in leisure hours and in University vacations paid employment must not be undertaken unless the employment is in itself necessary to the study or research proposed by the passage holder.

3. Passage holders will be expected to spend at least two years abroad. Return passages must, however, be taken up by the end of June in the third calendar year after the year of award.

4. Except in special circumstances passages shall not be tenable by married persons.

5. Graduates to whom passages are awarded must sign an undertaking that they will, on completion of their courses, return to Australia. Exemption from this regulation may in special circumstances be granted by the Conference.

6. In the case of engineering students, it is recognized that some of the time will necessarily be spent in shops and yards of engineering firms, but the Associated Lines have expressed a wish that where possible such students should supplement their practical work by attending a University.

7. Subject to the above conditions the selection committee will give preference to graduates who, although possessing sufficient means to live in Europe, could not afford to pay for their sea passages both ways.

Rhodes scholars are eligible for consideration in connection with these awards. Should the recipient of one of the passages prefer to travel other than first-class, this may be arranged subject to the Lines being able to provide such accommodation.

Applications on special forms, which may be obtained from the Registrar's Office, should be lodged with the Registrar on a date to be notified in April in each year.
CONDITIONS FOR THE AWARD OF DEGREE OF MASTER OF SCIENCE

1. An application to register as a candidate for the degree of Master of Science shall be made on the prescribed form which shall be lodged with the Registrar at least one full calendar month before the commencement of the term in which the candidate desires to register.

2. An applicant for registration for the degree of Master shall have been admitted to the degree of Bachelor of Science in the University of New South Wales, or other approved University, in an appropriate School.

3. (i) In exceptional cases persons may be permitted to register as candidates for the degree of Master if they submit evidence of such academic and professional attainments as may be approved by the Professorial Board.

(ii) The registration of diplomates of the New South Wales Department of Technical Education as candidates for the degree of Master of Science shall be determined in each case by the Professorial Board. Normally, such applicants shall be required to produce evidence of academic and professional progress over a period of five years from the time of gaining the diploma.

4. Notwithstanding any other provisions of these regulations the Professorial Board may require an applicant to demonstrate his fitness for registration by carrying out such work and sitting for such examinations as the Board may determine.

5. In every case, before permitting an applicant to register as a candidate, the Professorial Board shall be satisfied that adequate supervision and facilities are available.

6. An applicant approved by the Professorial Board shall register in one of the following categories:

   (i) Student in full-time attendance at the University.

   (ii) Student in part-time attendance at the University.

   (iii) Student working externally to the University.

7. An approved applicant shall be required to pay the undermentioned fees:

   (i) a registration fee of £2;

   (ii) the appropriate laboratory and supervision fee according to the category in which the student is registered;

   (iii) a fee of £15 when submitting the thesis for examination.
The combined laboratory and supervision fee shall be—

(a) £30 p.a. for students in full-time attendance at the University.

(b) £15 p.a. for students in part-time attendance at the University.

(c) £10 p.a. for students working externally to the University.

Fees to be paid in advance.

8. (i) Every candidate for the degree shall be required to submit a thesis embodying the results of an original investigation or design, to take such examinations and to perform such other work as may be prescribed by the Professorial Board. The candidate may submit also for examination any work he has published, whether or not such work is related to the thesis.

(ii) The investigation, design and other work as provided in paragraph 8 (i) shall be conducted under the direction of a supervisor appointed by the Board or under such conditions as the Board may determine.

(iii) Every candidate shall submit three copies of the thesis as provided under paragraph 8 (i).* All copies of the thesis shall be in double-spaced typescript, shall include a summary of approximately 200 words, and a certificate signed by the candidate to the effect that the work has not been submitted for a higher degree to any other University or institution. The original copy of the thesis for deposit in the Library shall be prepared and bound in a form approved by the University.† The other two copies of the thesis shall be bound in such manner as allows their transmission to the examiners without possibility of their disarrangement.

(iv) Unless there is a specific arrangement to the contrary, it shall be understood that the University retains the three copies of the thesis and is free to allow the thesis to be consulted or borrowed or to be issued in whole or in part in photostat or micro-film or other copying medium.

* The thesis and other relevant work may be submitted to the Registrar at any time during the year, within the provisions of paragraph 9 of the Master of Science Regulations.

† For the specifications currently approved for the preparation and binding of theses, see page 121.
9. No candidate shall be considered for the award of the degree until the lapse of six complete terms from the date from which the registration becomes effective, save that in the case of a candidate who has obtained the degree of Bachelor with Honours or who has had previous research experience, this period may, with the approval of the Professorial Board, be reduced by up to three terms.

10. For each candidate there shall be two examiners appointed by the Professorial Board, one of whom shall, if possible, be an external examiner.

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**PREPARATION AND BINDING OF HIGHER DEGREE THESIS**

The specifications currently approved are as follows:

(a) The size of the paper shall be quarto (approximately 10 in. x 8 in.) except for drawings and maps on which no restriction is placed.

(b) The margins on each sheet shall be not less than 1\(\frac{1}{2}\) in. on the left-hand side, \(\frac{1}{2}\) in. on the right-hand side, 1 in. at the top and \(\frac{3}{4}\) in. at the bottom.

(c) There shall be a title sheet showing thesis title, author's name, degree and date of submission.

(d) Sheets shall be numbered consecutively.

(e) Diagrams, charts, etc., must not be submitted on the back of typed sheets. Where possible, diagrams, charts, etc., should be included with the text, facing the page on which reference to them is made, otherwise they may be clearly referred to in the text, numbered and folded for insertion in a pocket on the back cover of the thesis binding. Folding diagrams or charts included in the text should be arranged so as to open out to the top and right.

(f) The thesis shall be bound according to specifications of which details may be obtained from the office of the Registrar.
CONDITIONS FOR THE AWARD OF DEGREE OF MASTER OF ENGINEERING

1. An application to register as a candidate for the degree of Master of Engineering shall be made on the prescribed form which shall be lodged with the Registrar at least one full calendar month before the commencement of the term in which the candidate desires to register.

2. An applicant for registration for the degree of Master shall have been admitted to a Bachelor's degree in Engineering in the University of New South Wales, or other approved University, in an appropriate School.

3. (i) In exceptional cases persons may be permitted to register as candidates for the degree of Master if they submit evidence of such academic and professional attainments as may be approved by the Professorial Board.
   (ii) The registration of diplomates of the New South Wales Department of Technical Education as candidates for the degree of Master of Engineering shall be determined in each case by the Professorial Board. Normally such applicants shall be required to produce evidence of academic and professional progress over a period of five years from the time of gaining the diploma.

4. Notwithstanding any other provisions of these regulations the Professorial Board may require an applicant to demonstrate his fitness for registration by carrying out such work and sitting for such examinations as the Board may determine.

5. In every case, before permitting an applicant to register as a candidate, the Professorial Board shall be satisfied that adequate supervision and facilities are available.

6. An applicant approved by the Professorial Board shall register in one of the following categories:
   (i) Student in full-time attendance at the University.
   (ii) Student in part-time attendance at the University.
   (iii) Student working externally to the University.

7. An approved applicant shall be required to pay the undermentioned fees:
   (i) A registration fee of £2;
   (ii) the appropriate laboratory and supervision fee according to the category in which the student is registered;
   (iii) a fee of £15 when submitting the thesis for examination.

The combined laboratory and supervision fee shall be—
(a) £30 p.a. for students in full-time attendance at the University;
(b) £15 p.a. for students in part-time attendance at the University;

(c) £10 p.a. for students working externally to the University. Fees shall be paid in advance.

8. (i) Every candidate for the degree shall be required to carry out a programme of advanced study, to take such examinations, and to perform such other work as may be prescribed by the Professorial Board. The programme shall include the preparation and submission of a thesis embodying the results of an original investigation or design. The candidate may submit also for examination any work he has published, whether or not such work is related to the thesis.

(ii) The investigation or design, and other work as provided in paragraph 8 (i) shall be conducted under the direction of a supervisor appointed by the Board or under such conditions as the Board may determine.

(iii) Every candidate shall submit three copies of the thesis as provided under paragraph 8 (i).* All copies of the thesis shall be in double-spaced typescript, shall include a summary of approximately 200 words, and a certificate signed by the candidate to the effect that the work has not been submitted for a higher degree to any other University or institution. The original copy of the thesis for deposit in the Library shall be prepared and bound in a form approved by the University.* The other two copies of the thesis shall be bound in such manner as allows their transmission to the examiners without possibility of disarrangement.

(iv) Unless there is a specific arrangement to the contrary it shall be understood that the University retains the three copies of the thesis and is free to allow the thesis to be consulted or borrowed or to be issued in whole or in part in photostat or micro-film or other copying medium.

9. No candidate shall be considered for the award of the degree until the lapse of six complete terms from the date from which the

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* The thesis and other relevant work may be submitted to the Registrar at any time during the year, within the provisions of paragraph 9 of the Master of Engineering Regulations.

In order that a successful candidate may have a reasonable chance of having his degree conferred at one of the formal degree conferring ceremonies, the candidate should arrange for his thesis and other relevant work to be in the hands of the Registrar at least fourteen weeks prior to the date of such ceremony.

† For the specifications currently approved for the preparation and binding of thesis, see page 121.
registration becomes effective, save that in the case of a full-time candidate who has obtained the degree of Bachelor with Honours or who has had previous research experience, this period may, with the approval of the Professorial Board, be reduced by not more than three terms.

10. For each candidate there shall be two examiners appointed by the Professorial Board, one of whom shall, if possible, be an external examiner.
CONDITIONS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE OR ENGINEERING WITHOUT SUPERVISION

Where it is not possible for candidates to register under the existing regulations for the degree of Master of Science or Master of Engineering by reason of their location at centres which are distant from University Schools and where effective supervision is not practicable, registration may be granted in these categories under the following conditions:—

(1) An application to register as an external candidate for the degree of Master of Science or Master of Engineering without supervision shall be lodged with the Registrar not less than six months before the intended date of submission of the thesis.* With such application the candidate shall submit the topic of his thesis and a synopsis in sufficient detail to enable the appointment of examiners.

(2) The subject of the thesis must be approved as being suitable by the Professorial Board.

(3) An applicant for registration shall have been admitted to a Bachelor's Degree of the University of New South Wales.

(4) An approved applicant shall be required to pay the following fees:—
   (i) A registration fee of £2.
   (ii) A fee of £30 when submitting thesis for examination.

(5) (i) Every candidate for the degree shall be required to submit a thesis of a satisfactory literary standard embodying the results of an original investigation or design. The candidate may also submit for examination any work he has published, whether or not such work is related to the thesis.
   (ii) Every candidate shall submit three copies of the thesis as provided under paragraph 5 (i). All copies of the thesis shall be in double-spaced typescript, shall include a summary of approximately 200 words and a certificate signed by the candidate to the effect that the work has not been submitted for a higher degree to any other University or institution. The original copy of the thesis for deposit in the Library shall be prepared and bound in a form approved by the University.† The other two copies of the thesis shall be bound in such manner as allows their transmission to the examiners without possibility of disarrangement.

* Candidates are advised to seek registration as early as possible.
† For the specifications currently approved for the preparation and binding of theses, see page 121.
(iii) Every candidate shall submit with the thesis a statutory declaration that the material contained therein is his own work, except where otherwise stated in the thesis.

(iv) Unless there is a specific arrangement to the contrary it shall be understood that the University will retain the three copies of the thesis and is free to allow the thesis to be consulted or borrowed or to be issued in whole or in part in photostat or microfilm or other copying medium.

(6) No candidate shall be considered for the award of the degree until the lapse of nine terms in the case of Honours graduates and twelve terms in the case of Pass graduates from the date of graduation.

(7) For each candidate the Professorial Board shall appoint at least two examiners one of whom shall be an internal examiner.

(8) If the thesis reaches the required standard the candidate shall be required to attend for an oral examination at a time and place nominated by the University. The examiners may also arrange at their discretion for the examination of the candidate by written papers and/or practical examinations on the subject of the thesis and/or subjects related thereto.
CONCLUSIONS FOR THE AWARD OF DEGREE OF MASTER OF ARCHITECTURE

1. Applications to register for the degree of Master of Architecture shall be made on the prescribed form which shall be lodged with the Registrar at least one full calendar month before the commencement of the term in which the candidate desires so to register.

2. Qualifications.—Admission as candidate for the degree of Master of Architecture shall be decided in each case by the Professorial Board. Persons in one of the following categories may be admitted as registered candidates:

(i) Those holding the degree of Bachelor of Architecture with Honours in the University of New South Wales or other approved University, in an appropriate department, save that a graduate who holds the degree of Bachelor of Architecture without Honours may be admitted as a candidate if evidence is submitted to the satisfaction of the Professorial Board that such candidate has attained, by additional work and study since graduating, a standard not lower than Second Class Honours. The Board may require such applicants to sit for such examinations or carry out such prescribed work as the Board may determine before the student is accepted as a candidate for the degree.

(ii) The admission of diplomates of the New South Wales Department of Technical Education as candidates for the degree of Master shall be determined in each case by the Professorial Board. Normally such candidates shall be required to produce evidence of academic and professional progress over a period of five (5) years from the time of gaining the diploma.

(iii) In exceptional cases persons may be admitted as candidates for the degree of Master if they submit evidence of such general and professional qualifications as may be approved by the Professorial Board.

3. Registration.—A candidate for registration for the degree of Master shall submit with his application a certificate from the Head of the School of Architecture, stating that the candidate is a fit person to undertake a course of study or research leading to the degree of Master of Architecture and that the School is willing to undertake the responsibility of supervising the work of the candidate and of reporting to the Professorial Board at the end of the course on the merits of the candidate’s performance.

4. A candidate approved by the Professorial Board shall register in one of the following categories.
5. **Fees.**—An approved candidate shall be required to pay the undermentioned fees:—

(i) A registration fee of £2.

(ii) The appropriate laboratory and studio and supervision fee, as follows—

(a) £10 p.a. for students working externally to the University;

(b) £15 p.a. for students in part-time attendance at the University;

(c) £30 p.a. for students in full-time attendance at the University.

(iii) A fee of £15 when submitting the thesis for examination.

Fees shall be paid in advance and no fees shall be refunded under any circumstances.

6. **Thesis:**

(i) Every candidate for the degree shall be required to submit a thesis embodying the results of original investigation or design or advanced study relative to Architecture or Building, to take such examinations and to perform such work as may be prescribed by the Professorial Board. The candidate may submit also for examination any other work he has undertaken or published, whether or not such work is related to the thesis.

(ii) The thesis, investigation, design and other prescribed work as provided in paragraph (i) shall be conducted under the guidance of a supervisor appointed by the Board or under such conditions as the Board may determine.

(iii) Every candidate shall submit three copies of the thesis (including any necessary plans and illustrations) as provided under paragraph (i) by 1st December of the year next preceding that in which the candidate may graduate. All copies of the thesis shall include a summary of approximately 200 words in the nature of an abstract, and a certificate over the hand of the candidate to the effect that the work has not been submitted to any other University or institution for a Degree, Diploma or any other qualification.
(iv) The thesis shall be in double-spaced typescript. The original copy of the thesis for deposit in the Library shall be prepared and bound in a form approved by the University.* The other two copies of the thesis shall be bound in such manner as allows their transmission to the examiners without possibility of disarrangement.

(v) Unless there is a specific arrangement to the contrary, the candidate understands that the University shall retain the three copies of the thesis and is free to allow the thesis to be consulted or borrowed or to be issued in whole or in part in photostat or microfilm or other copying medium.

7. No candidate shall be considered for the award of the degree until the lapse of six complete terms from the date of registration.

8. There shall be two examiners appointed by the Professorial Board, one of whom shall, if possible, be an external examiner.

* For the specifications currently approved for the preparation and binding of theses, see page 121.
CONDITIONS FOR THE AWARD OF DEGREE OF MASTER OF HOSPITAL ADMINISTRATION

(1) Applications to register for the Degree of Master of Hospital Administration shall be made on the prescribed form which shall be lodged with the Registrar at least one full calendar month before the commencement of the first term.

(2) Candidates for the degree of Master shall have obtained a degree of Bachelor in any discipline in the University of New South Wales or any other approved University.

(3) Persons may be admitted as candidates for the degree of Master if they submit evidence of such general and professional qualifications as may be approved by the Professorial Board.

(4) Candidates for the Master's degree shall be required to undertake one academic year in full-time attendance at the University followed by two full calendar years of Administrative-in-Service training in approved hospitals.

(5) An approved candidate shall be required to pay the undermentioned fees:

- Registration: £2
- 1st year: £90
- 2nd year: £30
- 3rd year: £30
- Graduation: £3

(6) Thesis requirements:

(i) Every candidate for the degree shall be required at the end of the three years to submit a thesis, the subject and title of which shall be approved not later than the end of the first of the two calendar years of Administrative-in-Service training.

The thesis shall embody the results of an original investigation or advanced study related to Hospital Administration. The thesis shall not be merely a descriptive survey, but shall contain an analysis, critical evaluation, appraisal and assessment of the subject.

The candidate shall be required to take any examinations and to perform any other work as may be prescribed by the Professorial Board.

The candidate may submit also for examination any other work he has undertaken or published, whether or not such work is related to the thesis.
(ii) The thesis, investigation and other prescribed work as provided in paragraph (i) shall be conducted under the guidance of a supervisor appointed by the Board or under such conditions as the Board may determine.

(iii) Every candidate shall submit three copies of the thesis (including any necessary plans and illustrations) as provided under paragraph (i) by 1st December of the year next preceding that in which the candidate may graduate. All copies of the thesis shall include a summary of approximately 200 words in the nature of an abstract, and a certificate over the hand of the candidate to the effect that the work has not been submitted to any other University or institution for a Degree, Diploma or any other qualification.

(iv) The thesis shall be in double-spaced typescript. The original copy of the thesis for deposit in the Library shall be prepared and bound in a form approved by the University.* The other two copies of the thesis shall be bound in such manner as allows their transmission to the examiners without possibility of disarrangement.

(v) Unless there is a specific arrangement to the contrary, the candidate understands that the University shall retain the three copies of the thesis and is free to allow the thesis to be consulted or borrowed or to be issued in whole or in part in photostat or micro-film or other copying medium.

*For the specifications currently approved for the preparation and binding of theses, see page 121.
CONDITIONS FOR THE AWARD OF DEGREE OF MASTER OF COMMERCE

1. An application to register as a candidate for the degree of Master of Commerce shall be made on the prescribed form which shall be lodged with the Registrar at least one full calendar month before the commencement of the term in which the candidate desires to register.

2. An applicant for registration for the degree of Master shall have been admitted to a Bachelor's degree in Commerce in the University of New South Wales, or an appropriate degree of any other approved University.

3. (i) In exceptional cases persons may be permitted to register as candidates for the degree of Master if they submit evidence of such academic and professional attainments as may be approved by the Professorial Board.

   (ii) The registration of diplomates of the New South Wales Department of Technical Education as candidates for the degree of Master of Commerce shall be determined in each case by the Professorial Board. Normally, such applicants shall be required to produce evidence of academic and professional progress over a period of five years from the time of gaining the diploma.

4. Notwithstanding any other provisions of these regulations the Professorial Board may require an applicant to demonstrate his fitness for registration by carrying out such work and sitting for such examinations as the Board may determine.

5. In every case, before permitting an applicant to register as a candidate, the Professorial Board shall be satisfied that adequate supervision and facilities are available.

6. An applicant approved by the Professorial Board shall register in one of the following categories:

   (i) Student in full-time attendance at the University.
   (ii) Student in part-time attendance at the University.
   (iii) Student working externally to the University.

7. An approved applicant shall be required to pay the under-mentioned fees—

   (i) a registration fee of £2
   (ii) the appropriate laboratory and supervision fee according to the category in which the student is registered.
   (iii) a fee of £15 when submitting the thesis for examination.

   The combined laboratory and supervision fee shall be—

   (a) £30 p.a. for students in full-time attendance at the University.
   (b) £15 p.a. for students in part-time attendance at the University.
(c) £10 p.a. for students working externally to the University. Fees shall be paid in advance.

8. (i) Every candidate for the degree shall be required to carry out a programme of advanced study, to take such examinations and to perform such other work as may be prescribed by the Professorial Board. The programme shall include the preparation and submission of a thesis embodying the results of an original investigation or design. The candidate may submit also for examination any work he has published, whether or not such work is related to the thesis.

(ii) The investigation or design and other work as provided in paragraph 8 (i) shall be conducted under the direction of a supervisor appointed by the Board or under such conditions as the Board may determine.

(iii) Every candidate shall submit three copies of the thesis as provided under paragraph 8 (i). All copies of the thesis shall be in double-spaced typescript, shall include a summary of approximately 200 words, and a certificate signed by the candidate to the effect that the work has not been submitted for a higher degree to any other University or institution. The original copy of the thesis for deposit in the Library shall be prepared and bound in a form approved by the University.* The other two copies of the thesis shall be bound in such manner as allows their transmission to the examiners without possibility of disarrangement.

(iv) Unless there is a specific arrangement to the contrary it shall be understood that the University retains the three copies of the thesis and is free to allow the thesis to be consulted or borrowed or to be issued in whole or in part in photostat or micro-film or other copying medium.

9. No candidate shall be considered for the award of the degree until the lapse of six complete terms from the date from which the registration becomes effective, save that in the case of a full-time candidate who has obtained the degree of Bachelor with Honours or who has had previous research experience, this period may, with the approval of the Professorial Board, be reduced by not more than three terms.

10. For each candidate there shall be two examiners appointed by the Professorial Board, one of whom shall, if possible, be an external examiner.

*For the specifications currently approved for the preparation and binding of theses, see page 121.
CONDITIONS FOR THE AWARD OF THE DEGREE OF MASTER OF TECHNOLOGY IN THE FACULTIES OF ENGINEERING AND TECHNOLOGY

1. An application to register as a candidate for the degree of Master of Technology shall be made on the prescribed form which shall be lodged with the Registrar at least one full calendar month before the commencement of the course.

2. An applicant for registration for the degree of Master of Technology shall have been admitted to the Degree of Bachelor with Honours in the University of New South Wales, or other approved University, in an appropriate School. A pass graduate may be admitted on the recommendation of the Head of the School and with the confirmation of Faculty.

3. In exceptional cases a person may be permitted to register as a candidate for the degree of Master of Technology if he submits evidence of such academic and professional attainments as may be approved by Faculty.

4. Notwithstanding any other provisions of these regulations Faculty may require an applicant to demonstrate his fitness for registration by carrying out such work and sitting for such examinations as Faculty may determine.

5. An approved applicant shall be required to pay the fee for the course in which he desires to register. Fees shall be paid in advance.

6. A candidate for the degree shall be required to undertake the appropriate course of study, to pass any prescribed examinations and in addition, to submit a report on a project specified by the Head of the School. The format of the report shall accord with the instructions of the Head of the School.

7. A candidate may submit the report on the project at the completion of the formal part of the course, but in any case shall submit it not later than one year after the completion of such course.

8. The report on the project shall be examined by two examiners appointed by the Professorial Board, one of whom shall, if possible, be an external examiner.

9. A candidate may be required to attend for an oral examination at a time and place fixed by the examiners.
CONDITIONS FOR THE AWARD OF DEGREE OF DOCTOR OF PHILOSOPHY, (Ph.D.) IN THE FACULTIES OF SCIENCE, ENGINEERING, TECHNOLOGY, AND ARCHITECTURE

1. The degree of Doctor of Philosophy may be granted by the Council on the recommendation of the Professorial Board to a candidate who has made an important contribution to knowledge and who has satisfied the following By-laws and Regulations made in accordance with these By-Laws.

Qualifications

2. A candidate for registration for the degree of Ph.D. shall—
   (i) hold an Honours degree from the University of New South Wales; or
   (ii) hold an Honours degree of equivalent standing from any other approved University; or
   (iii) if he holds a degree without Honours from the University of New South Wales or an approved University, have achieved by subsequent work and study a standard recognised by the Board as equivalent to Honours; or
   (iv) in exceptional cases, submit such other evidence of general and professional qualifications as may be approved by the Professorial Board.

3. When the Professorial Board is not satisfied with the qualifications submitted by a candidate, the Board may require him, before he is permitted to register, to undergo such examination or carry out such work as the Board may prescribe.

Registration

4. A candidate for registration for a course of study leading to the degree of Ph.D. shall—
   (i) apply to the Registrar on the prescribed form at least one calendar month before the commencement of the term in which he desires to register; and
   (ii) submit with his application a certificate from the Head of the University School in which he proposes to study stating that the candidate is a fit person to undertake a course of study or research leading to the Ph.D. degree and that the School is willing to undertake the responsibility of supervising the work of the candidate and of reporting to the Professorial Board at the end of the course on the merits of the candidate's performance in the prescribed course of study.
Course of Study

5. Subsequent to registration the candidate shall pursue a course of advanced study and research for at least nine academic terms, save that—

(i) a candidate who is not fully engaged in research work for his degree will be required to satisfy the Professorial Board on the amount of time he can devote to research work for the degree; and he may not proceed to the degree before the expiration of ten academic terms from the date of registration as a candidate;

(ii) any candidate who before registration was engaged upon research to the satisfaction of the Professorial Board, may be exempted from three academic terms.

6. A candidate shall present himself for examination not later than fifteen academic terms from the date of his registration, unless special permission for an extension of time be granted by the Professorial Board.

7. The course, other than field work, must be carried out in a School of the University, under the direction of a supervisor appointed by the Board, or under such conditions as the Board may determine, save that a candidate may be granted special permission by the Board to spend a period of not more than three academic terms in research at another institution approved by the Board.

8. Not later than three academic terms after registration the candidate shall submit the subject of his thesis for approval by the Professorial Board. After the subject has been approved it may not be changed except with the permission of the Board.

9. A candidate may be required to attend a formal course of study appropriate to his work.

Thesis

10. On completing his course of study every candidate must submit a thesis which complies with the following requirements:

(i) The greater proportion of the work described must have been completed subsequent to registration for the Ph.D. degree.

(ii) It must be a distinct contribution to the knowledge of the subject.

(iii) It must be written in English and reach a satisfactory standard of literary presentation.
11. The thesis must consist of the candidate's own account of his research. In special cases work done conjointly with other persons may be accepted, provided the Professorial Board is satisfied on the candidate's part in the joint research.

12. Every candidate shall be required to submit with his thesis a short abstract of the thesis comprising not more than 300 words.

13. A candidate may not submit as the main content of his thesis any work or material which he has previously submitted for a University degree or other similar award.

14. Unless there is a specific arrangement to the contrary, the University will be free to allow the thesis to be consulted or borrowed or to be issued in whole or in part in photostat or micro-film or other copying medium.

Entry for Examination

15. The candidate shall give in writing two months' notice of his intention to submit his thesis and such notice shall be accompanied by the appropriate fee.

16. Four copies of the thesis shall be submitted together with a certificate from the Supervisor that the candidate has completed the course of study prescribed in his case.

17. The thesis shall be in double-spaced typescript. The original copy for deposit in the Library shall be prepared and bound in a form approved by the University.* The other three copies shall be bound in such manner as allows their transmission to the examiners without possibility of disarrangement.

18. The candidate may also submit as separate supporting documents any work he has published, whether or not it bears on the subject of the thesis.

19. The Professorial Board shall appoint the examiners, one of whom shall normally be an external examiner.

20. After the examiners have read the thesis they may—

(i) without further test recommend the candidate for rejection;

(ii) request additional work on the thesis before proceeding further with the examination.

*For the specifications currently approved for the preparation and binding of theses, see page 121.
21. If the thesis reaches the required standard, the examiners shall arrange for the candidate to be examined orally, and, at their discretion, by written papers and/or practical examinations on the subject of the thesis and/or subjects relevant thereto.

22. If the thesis is adequate but the candidate fails to satisfy the examiners at the oral or other examinations, the examiners may recommend the University to permit the candidate to re-present the same thesis and submit to a further oral, practical or written examination within a period specified by them but not exceeding eighteen months.

23. At the conclusion of the examination, the examiners will submit to the Professorial Board a concise report on the merits of the thesis and on the examination results.

Fees

24. The fee payable for an examination qualifying for registration shall be £5.

25. An approved candidate shall pay—
   (i) a registration fee of £2.
   (ii) a supervision fee of £30 per annum.
   (iii) a fee of £21 on application for the examination.

26. Fees shall be paid in advance and no fees shall be refunded under any circumstances.
In May of 1954, the University Council established the Institute of Nuclear Engineering to develop and encourage research in the various fields of nuclear engineering within the University. Later in the same year the State Government made a grant to the University of £125,000 for the purchase of equipment and the promotion of research into nuclear engineering.

In carrying out its functions the Institute sponsors research projects in nuclear engineering within the University's schools and in some cases provides the necessary equipment. In addition to these research activities a number of courses of instruction are given in different aspects of nuclear engineering. The annual programme includes a one year introductory course in nuclear engineering, and courses of approximately 15 lectures each on the applications of radio-isotopes in various fields and on the techniques of programming problems for the digital computer UTECOM. Laboratory courses in radio-isotope techniques for graduate students are also conducted, these being designed to provide a basic knowledge of the safe handling and effective use of radio-active materials. Other courses of lectures in different fields of nuclear engineering are offered from time to time.

The Institute is governed by a Committee of professors of the University under the chairmanship of the Vice-Chancellor as follows:

J. P. Baxter, Vice-Chancellor, Professor of Chemical Engineering (Chairman).
D. W. Phillips, Pro-Vice-Chancellor, Professor of Mining Engineering.
D. P. Mellor, Professor of Inorganic Chemistry.
C. J. Milner, Professor of Applied Physics.
R. H. Myers, Professor of Metallurgy.
R. E. Vowels, Professor of Electrical Engineering.
A. H. Willis, Professor of Mechanical Engineering.
L. C. Woods, Nuffield Research Professor of Mechanical Engineering.
OUTLINES OF COURSES OF STUDY

The outlines of the courses offered in the various schools are set out below.

For purposes of reference each school within the University, except the School of Humanities and Social Sciences, utilizes a Roman numeral to denote the courses of study leading to a degree which it mainly provides. Similarly the subjects provided in the various courses by each school are denoted by an Arabic number, the first figure in which corresponds with the Roman numeral utilized by the school providing the subject.

The Science course, in which many schools participate, is given the Roman numeral XXII.

Subjects given by the School of Humanities and Social Sciences are denoted by the letter G followed by a distinguishing number.

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<th>School</th>
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<tr>
<td>Humanities and Social Sciences</td>
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The time given to each subject is shown in two parts, the first figure representing lecture hours per week, the second, laboratory, tutorial or practical work in hours per week. These times represent the average distribution over the term or year, but may be varied from time to time according to the nature of the work. Lecture
time may not always be used for formal instruction, but may be devoted to discussions, assignments in the library, film presentation, or other means of instruction.

Descriptions of the subjects given in each course are set out in a later section of the Calendar entitled "Description of Subjects of Instruction". The subjects are there grouped under the school which provides them.

Courses at Newcastle University College

A list of subjects offered to students taking an Arts course at the Newcastle University College appears on page 316 of this Calendar.

In general, the professional courses provided at Newcastle University College are identical with the courses as given at Sydney. Details of the courses available at Newcastle University College are given in the College Handbook.
SCHOOL OF APPLIED PHYSICS

The course in Applied Physics is designed to equip students for research in industry and in the field of applied science generally. The course, which extends over four years, provides a thorough training in the fundamentals of physical science and in mathematics, and particular emphasis is placed on technological applications. The practical training includes courses in physical techniques (e.g., high vacuum, electronics, photometric photography) and courses in formal experimentation designed to develop the research outlook. The extramural training includes substantial periods in industry in each of the second and third years. On the mathematical side, not only is particular attention given to the formal training required by a physicist, but special courses are given in the application of statistical methods to industrial experimentation.

In addition to the day course in Applied Physics, which leads to the degree of Bachelor of Science (Pass or Honours), Conversion Courses in Applied Physics and Optometrical Science are offered, details of which are shown on pages 143 to 145.

COURSE I—APPLIED PHYSICS

FIRST YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.11 Physics</td>
<td>3 — 3—1*</td>
<td>3 — 3—1*</td>
</tr>
<tr>
<td>1.21 Physical Techniques I</td>
<td>0 — 2</td>
<td>0 — 2</td>
</tr>
<tr>
<td>2.41A General Chemistry</td>
<td>3 — 6</td>
<td>3 — 6</td>
</tr>
<tr>
<td>5.101 Engineering Drawing and Materials</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>10.11 Mathematics</td>
<td>4 — 2*</td>
<td>4 — 2*</td>
</tr>
<tr>
<td>10.11B Mathematics</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>G10 English</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G20 History</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14 —14</strong></td>
<td><strong>14 —14</strong></td>
</tr>
</tbody>
</table>

SECOND YEAR

(24 weeks day course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.12 Physics</td>
<td>3 — 3—1*</td>
</tr>
<tr>
<td>1.22 Physical Techniques II</td>
<td>0 — 3</td>
</tr>
<tr>
<td>2.32A Physical Chemistry</td>
<td>2 — 0</td>
</tr>
<tr>
<td>4.912 Materials Technology</td>
<td>1 — 2</td>
</tr>
<tr>
<td>5.211A Workshop Processes and Practice</td>
<td>3 — 2*</td>
</tr>
<tr>
<td>10.12 Mathematics</td>
<td>9 —14</td>
</tr>
</tbody>
</table>

* Tutorial.
Third Year
(24 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Term 1</td>
</tr>
<tr>
<td></td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.13 Physics</td>
<td>6 — 3-1*</td>
</tr>
<tr>
<td>1.23a Physical Techniques III</td>
<td>0 — 0</td>
</tr>
<tr>
<td>1.23b Physical Techniques IV</td>
<td>0 — 3</td>
</tr>
<tr>
<td>1.23c Physical Techniques V</td>
<td></td>
</tr>
<tr>
<td>1.23d Physical Techniques VI</td>
<td>0 — 2</td>
</tr>
<tr>
<td>6.83 Electrical Engineering</td>
<td>2 — 3</td>
</tr>
<tr>
<td>10.13 Mathematics</td>
<td>5 — 0</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td>17 — 12</td>
</tr>
</tbody>
</table>

* Tutorial

Fourth Year
(34 weeks day course)

The fourth year is much more flexible than the earlier years in the allocation of time between lectures and laboratory and tutorial work, and the formal instruction is interspersed with colloquia and study group work. The following time-table is representative:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Term 1</td>
</tr>
<tr>
<td></td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.14 Physics</td>
<td>5 — 9-2*</td>
</tr>
<tr>
<td>10.14 Mathematics</td>
<td>6 — 0</td>
</tr>
<tr>
<td>Advanced Elective (Humanities</td>
<td>2 — 0</td>
</tr>
<tr>
<td>or Social Science)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 — 11</td>
</tr>
</tbody>
</table>

* Tutorial

Conversion Course—Ic1—Applied Physics

Holders of a diploma in Physics who have completed the course of study set out in the current Handbook of the N.S.W. Department of Technical Education may qualify for the degree of Bachelor of Science in Applied Physics by—

†(a) Full-time attendance and successful completion of the fourth year of the degree course with the following variation.

†Option (a) is available only to holders of the Physics diploma who have had at least one year's industrial experience in an occupation involving the application of physical principles, or who have equivalent occupational qualifications.
Portion of the syllabus already taken in the diploma course to be omitted and replaced by 4.912, Materials Technology, and the fourth year Humanities subject to be replaced by conversion Humanities (English or History or Philosophy and Government or Psychology or Economics or Sociology).

Or

†(b) Successful completion of a part-time course of two years’ duration as follows—

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st year</td>
</tr>
<tr>
<td>Advanced Visual Physiology and Physiological Optics</td>
<td>5</td>
</tr>
<tr>
<td>Advanced Clinical Optometry</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics</td>
<td>2</td>
</tr>
<tr>
<td>Economics or G53 Government or G63 Psychology or G83 Sociology</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>11½</strong></td>
</tr>
</tbody>
</table>

CONVERSION COURSE 1c2—OPTOMETRICAL SCIENCE

Associates of the Sydney Technical College in Optometry may qualify for the award of the degree of Bachelor of Science by satisfactorily completing the requirements as set out below. In general, the requirements fall into two main categories as shown hereunder, but these may be varied by the Professorial Board in individual cases according to the record of the student.

A. Conversion Course for holders of 5-year Diploma (1952 and subsequently).

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Visual Physiology and Physiological Optics</td>
<td>5</td>
</tr>
<tr>
<td>Advanced Clinical Optometry</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics and Statistics</td>
<td>2</td>
</tr>
<tr>
<td>Conversion Humanities—English or History or Philosophy and Psychology or Economics or Government or Sociology</td>
<td>4</td>
</tr>
</tbody>
</table>

To be taken in one year of full-time study, or two years of part-time study of approximately 7 hours per week.

† Option (b) is available only to holders of the Physics diploma who, at the conclusion of the conversion course, will have had at least three years’ experience of the type mentioned in connection with option (a).
### E. Conversion Course for holders of 4-year Diploma (1930-1931).

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optometry II</td>
<td>2</td>
</tr>
<tr>
<td>Clinical Optometry II</td>
<td>3</td>
</tr>
<tr>
<td>Theory of Optical Instruments</td>
<td>1</td>
</tr>
<tr>
<td>Psychology II</td>
<td>2</td>
</tr>
<tr>
<td>Optometry III</td>
<td>2</td>
</tr>
<tr>
<td>Advanced Visual Physiology and Physiological Optics</td>
<td>5</td>
</tr>
<tr>
<td>Advanced Clinical Optometry</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics and Statistics</td>
<td>2</td>
</tr>
<tr>
<td><strong>Conversion Humanities</strong></td>
<td></td>
</tr>
<tr>
<td>English or History or Philosophy, and</td>
<td></td>
</tr>
<tr>
<td>Psychology or Economics or Government or Sociology</td>
<td>4</td>
</tr>
</tbody>
</table>

To be taken in two or three years of part-time study, as selected by the student, of approximately 12 or 8 hours per week.
SCHOOL OF CHEMISTRY

The needs of the chemical industry for men competent to devise, develop and operate new processes and to improve existing ones, make essential different types of training. One type involves a training in fundamental science with the emphasis on chemistry. Training of this type is provided by the School of Chemistry where students receive instruction in the principles of inorganic, analytical, organic and physical chemistry, supplemented by instruction in mathematics and physics. In his final year the student is given the opportunity of electing certain subjects to enable him to extend his knowledge in fields of special interest.

It should be noted that the first year of the full-time Applied Chemistry course is identical with the first year of Chemical Engineering, Food Technology, Fuel Technology, Metallurgy and Textile Technology. In the first two years of the part-time course the work in chemistry, physics and mathematics is identical with that taken in the same years of the Chemical Engineering, Food Technology, Industrial Chemistry and Metallurgy courses. Students in any of these courses may, therefore, transfer from one to another without loss of standing, up to the end of the first year full-time, or second year part-time.

In addition to the courses in Applied Chemistry, the School offers courses in chemistry which form part of the requirements of the Science degree (see page 304); it also offers courses in Leather Chemistry.

COURSE II—APPLIED CHEMISTRY

This course may be taken at Pass or Honours standard. The Pass course requires full-time attendance at the University for the first and second years and part-time attendance for the third and fourth years. The Honours course requires full-time attendance for three years, the fourth year requiring full-time attendance for one term and part-time attendance for two terms. Both Pass and Honours students will be required to complete satisfactorily a course of approved practical training in industry.
**First Year**
*(34 weeks day course)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td><strong>Honrs per week</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.11  Physics</td>
<td>3 — 3</td>
<td>3 — 3</td>
<td>3 — 3</td>
</tr>
<tr>
<td>2.41  General Chemistry</td>
<td>3 — 6</td>
<td>3 — 6</td>
<td>3 — 6</td>
</tr>
<tr>
<td>5.10  Engineering Drawing</td>
<td>2 — 0</td>
<td>1 — 3</td>
<td>0 — 0</td>
</tr>
<tr>
<td><strong>Materials</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.21  Workshop Processes</td>
<td>0 — 3</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>10.11  Mathematics</td>
<td>4 — 2*</td>
<td>4 — 2*</td>
<td>0 — 0</td>
</tr>
<tr>
<td>10.11b  Mathematics</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>2 — 2*</td>
</tr>
<tr>
<td>G10  English</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>G20  History</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15 — 14</td>
<td>14 — 14</td>
<td>10 — 11</td>
</tr>
</tbody>
</table>

* Tutorial.

**Second Year**
*(34 weeks day course)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td><strong>Honrs per week</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.92  Physics</td>
<td>1 1/2</td>
<td>1 1/2</td>
<td>1 1/2</td>
</tr>
<tr>
<td>2.32  Physical Chemistry</td>
<td>1 — 2 1/2</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>2.33  Physical Chemistry</td>
<td>1 — 2 1/2</td>
<td>1 — 2 1/2</td>
<td>1 — 2 1/2</td>
</tr>
<tr>
<td>2.42  Inorganic Chemistry</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>2.52  Quantitative Analysis</td>
<td>1 — 2 1/2</td>
<td>1 — 2 1/2</td>
<td>1 — 2 1/2</td>
</tr>
<tr>
<td>2.53  Quantitative Analysis</td>
<td>1 — 2 1/2</td>
<td>1 — 2 1/2</td>
<td>1 — 2 1/2</td>
</tr>
<tr>
<td>2.62  Organic Chemistry</td>
<td>1 — 0</td>
<td>1 — 2 1/2</td>
<td>1 — 0</td>
</tr>
<tr>
<td>2.63  Organic Chemistry</td>
<td>1 — 2 1/2</td>
<td>1 — 2 1/2</td>
<td>1 — 2 1/2</td>
</tr>
<tr>
<td>2.72  Mathematical Chemistry</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>G30  Philosophy</td>
<td>0 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>9 1/2</td>
<td>11 1/2</td>
<td>11 1/2</td>
</tr>
</tbody>
</table>

*Alternative Subject—

2.23  Chemical Instrumentation 1 — 1 1/2| 1 — 1 1/2| 1 — 1 1/2

**Third Year**
*(34 weeks of 2 half days and 3 evenings per week)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td><strong>Honrs per week</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.34  Physical Chemistry</td>
<td>1 — 4 1/2</td>
<td>1 — 4 1/2</td>
<td>1 — 4 1/2</td>
</tr>
<tr>
<td>2.73  Mathematical Chemistry</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>2.64  Organic Chemistry</td>
<td>1 — 4 1/2</td>
<td>1 — 4 1/2</td>
<td>1 — 4 1/2</td>
</tr>
<tr>
<td>*2.64a  Social Science Elective</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5 — 9</td>
<td>5 — 9</td>
<td>3 — 9</td>
</tr>
</tbody>
</table>

* 2.64a is to be taken by students desiring to take 2.65a or 2.65b in fourth year.
**Fourth Year**

(34 weeks of 2 half days and 2 evenings per week)

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>3.14A <em>Industrial Chemistry</em></td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>0—0</td>
<td>2—0</td>
<td>2—0</td>
</tr>
<tr>
<td><strong>Plus one of:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.35 Applied Physical Chemistry</td>
<td>1—4½</td>
<td>1½—4½</td>
<td>1—4½</td>
</tr>
<tr>
<td>2.44 Inorganic Chemistry</td>
<td>1—4½</td>
<td>1—4½</td>
<td>1—4½</td>
</tr>
<tr>
<td>2.54 Quantitative Analysis</td>
<td>1—4½</td>
<td>1—4½</td>
<td>1—4½</td>
</tr>
<tr>
<td>2.65 (A or B) Applied Organic Chemistry</td>
<td>1—4½</td>
<td>1—4½</td>
<td>1—4½</td>
</tr>
<tr>
<td>2.85 Nuclear and Radiation Chemistry</td>
<td>1—4½</td>
<td>1—4½</td>
<td>1—4½</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2½—5</td>
<td>4½—5</td>
<td>4½—5</td>
</tr>
</tbody>
</table>

* Includes Factory visits.

**Honours**

Students desiring to take Honours must apply to the Head of the School of Chemistry not later than 31st December of the year in which the second year is completed. Practical training in the chemical industry will be undertaken during those two terms in which the student studies part-time.

Candidates for Honours are required to complete the following programme in third and fourth years.

**Third Year**

(34 weeks day course)

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>2.34 Physical Chemistry</td>
<td>1—4½</td>
<td>1—4½</td>
<td>1—4½</td>
</tr>
<tr>
<td>2.64 Organic Chemistry</td>
<td>1—4½</td>
<td>1—4½</td>
<td>1—4½</td>
</tr>
<tr>
<td><strong>or</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.73 Mathematical Chemistry</td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>3.14 Industrial Chemistry*</td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2—0</td>
<td>2—0</td>
<td>0—0</td>
</tr>
<tr>
<td><strong>Plus one of:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.44 Inorganic Chemistry</td>
<td>1—4½</td>
<td>1—4½</td>
<td>1—4½</td>
</tr>
<tr>
<td>2.54 Quantitative Analysis</td>
<td>1—4½</td>
<td>1—4½</td>
<td>1—4½</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7½—14</td>
<td>7½—14</td>
<td>5½—14</td>
</tr>
</tbody>
</table>

* Includes Factory visits

† In 1959 Honours students in fourth year will complete the syllabus set out in the 1956 Calendar.
FOURTH YEAR†
(One term full-time, two terms part-time)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.44 Inorganic Chemistry</td>
<td>1 - 4½</td>
<td>1 - 4½</td>
<td>1 - 4½</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>0 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Research Project*</td>
<td>0 - 20</td>
<td>0 - 3</td>
<td>0 - 3</td>
</tr>
<tr>
<td>If 2.44 was completed in third year, then one of:—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.35 Applied Physical Chemistry</td>
<td>1 - 4½</td>
<td>1 - 4½</td>
<td>1 - 4½</td>
</tr>
<tr>
<td>2.54 Quantitative Analysis</td>
<td>1 - 4½</td>
<td>1 - 4½</td>
<td>1 - 4½</td>
</tr>
<tr>
<td>2.65 Applied Organic Chemistry</td>
<td>1 - 4½</td>
<td>1 - 4½</td>
<td>1 - 4½</td>
</tr>
<tr>
<td>2.85 Nuclear and Radiation Chemistry</td>
<td>1 - 4½</td>
<td>1 - 4½</td>
<td>1 - 4½</td>
</tr>
</tbody>
</table>

*Full-time work (20 hours) on the Project may be completed in first, second or third terms.
†In 1959 Honours students in fourth year will complete the Syllabus set out in the 1956 Calendar.

COURSE IIb1—APPLIED CHEMISTRY
Course IIb1 has been designed for students employed in the chemical industry. The programme of study is equivalent to that of Course II, but Course IIb1 extends over six or seven part-time years, depending on whether a Pass or Honours degree is taken.

FIRST YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11 Physics, Part I</td>
<td>1½ - 1½</td>
<td>1½ - 1½</td>
<td>1½ - 1½</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
<td>2 - 4</td>
<td>2 - 4</td>
<td>2 - 4</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part I</td>
<td>2 - 1*</td>
<td>2 - 1*</td>
<td>2 - 1*</td>
</tr>
<tr>
<td>Tutorial</td>
<td>5½ - 6½</td>
<td>5½ - 6½</td>
<td>5½ - 6½</td>
</tr>
</tbody>
</table>

SECOND YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11 Physics, Part II</td>
<td>1½ - 1½</td>
<td>1½ - 1½</td>
<td>1½ - 1½</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part II</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>5.101 Engineering Drawing and Materials</td>
<td>2 - 0</td>
<td>1 - 3</td>
<td>0 - 0</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part II</td>
<td>2 - 1*</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
</tr>
<tr>
<td>Tutorial</td>
<td>6½ - 4½</td>
<td>4½ - 7½</td>
<td>3½ - 4½</td>
</tr>
</tbody>
</table>
### Third Year

**(34 weeks part-time course)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics *</td>
<td>1½ - 0</td>
<td>1½ - 1½</td>
<td>1½ - 1½</td>
</tr>
<tr>
<td>Physical Chemistry</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 2½</td>
</tr>
<tr>
<td>Inorganic Chemistry</td>
<td>1 - 2½</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Quantitative Analysis</td>
<td>1 - 2½</td>
<td>1 - 2½</td>
<td>1 - 2½</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>1 - 0</td>
<td>1 - 2½</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Mathematical Chemistry</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6½ - 5</td>
<td>6¼ - 6¼</td>
<td>6¼ - 6¼</td>
</tr>
</tbody>
</table>

* *Alternative Subject—*

**2.23 Chemical Instrumentation:** 1 - 1½ 1 - 1½ 1 - 1½

### Fourth Year

**(34 weeks part-time course)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Chemistry</td>
<td>1 - 2</td>
<td>1 - 2½</td>
<td>1 - 2½</td>
</tr>
<tr>
<td>Quantitative Analysis</td>
<td>1 - 2½</td>
<td>1 - 2½</td>
<td>1 - 2½</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>1 - 2½</td>
<td>1 - 2</td>
<td>1 - 2½</td>
</tr>
<tr>
<td>Mathematical Chemistry</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Industrial Chemistry*</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5½ - 7½</td>
<td>5½ - 7½</td>
<td>5½ - 7½</td>
</tr>
</tbody>
</table>

* *Includes Factory visits—*

### Fifth Year

**(34 weeks part-time course)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Chemistry</td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
</tbody>
</table>

**Plus one of—**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Physical Chemistry</td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Inorganic Chemistry</td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Quantitative Analysis</td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Applied Organic Chemistry</td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
</tbody>
</table>

*(A or B)*

*2.85D Nuclear and Radiation Chemistry* 1 - 3 1 - 3 1 - 3

**Total** 3 - 9 3 - 9 3 - 9

---

150
### SIXTH YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th></th>
<th>Term 2</th>
<th></th>
<th>Term 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>G13 English or G23 History</td>
<td>2 — 0</td>
<td></td>
<td>2 — 0</td>
<td></td>
<td>2 — 0</td>
<td></td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>1 — 0</td>
<td></td>
<td>1 — 0</td>
<td></td>
<td>1 — 0</td>
<td></td>
</tr>
<tr>
<td>G43 Economics or G63 Psychology or G63 Sociology</td>
<td>2 — 0</td>
<td></td>
<td>2 — 0</td>
<td></td>
<td>2 — 0</td>
<td></td>
</tr>
<tr>
<td>G50.1 Government</td>
<td>1 — 0</td>
<td></td>
<td>1 — 0</td>
<td></td>
<td>1 — 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 — 0</td>
<td></td>
<td>6 — 0</td>
<td></td>
<td>6 — 0</td>
<td></td>
</tr>
</tbody>
</table>

### ADDITIONAL FOR HONOURS

Students desiring to take Honours must apply to the Head of the School of Chemistry not later than 31st December in the year in which the fifth year is completed. The full programme of study (i.e. the Humanities and the course set out below) may be taken over two part-time years or one full-time year.

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th></th>
<th>Term 2</th>
<th></th>
<th>Term 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>2.44D Inorganic Chemistry</td>
<td>1 — 3</td>
<td></td>
<td>1 — 3</td>
<td></td>
<td>1 — 3</td>
<td></td>
</tr>
<tr>
<td>Research Project</td>
<td>0 — 10</td>
<td></td>
<td>0 — 10</td>
<td></td>
<td>0 — 10</td>
<td></td>
</tr>
<tr>
<td>If 2.44D was taken in fifth year, then one of—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.35D Applied Physical Chemistry</td>
<td>1 — 3</td>
<td></td>
<td>1 — 3</td>
<td></td>
<td>1 — 3</td>
<td></td>
</tr>
<tr>
<td>2.54D Quantitative Analysis</td>
<td>1 — 3</td>
<td></td>
<td>1 — 3</td>
<td></td>
<td>1 — 3</td>
<td></td>
</tr>
<tr>
<td>2.65 Applied Organic Chemistry</td>
<td>1 — 3</td>
<td></td>
<td>1 — 3</td>
<td></td>
<td>1 — 3</td>
<td></td>
</tr>
<tr>
<td>(A or B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.85D Nuclear and Radiation Chemistry</td>
<td>1 — 3</td>
<td></td>
<td>1 — 3</td>
<td></td>
<td>1 — 3</td>
<td></td>
</tr>
</tbody>
</table>

### COURSE IIb3—LEATHER CHEMISTRY

This part-time course provides advanced instruction in chemistry for persons employed in the Leather industry. The course may be taken over six years for a Bachelor of Science (Pass) degree, or over seven years for an Honours degree.

### FIRST YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th></th>
<th>Term 2</th>
<th></th>
<th>Term 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.11 Physics, Part I</td>
<td>1½ — 1½</td>
<td></td>
<td>1½ — 1½</td>
<td></td>
<td>1½ — 1½</td>
<td></td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
<td>2 — 4</td>
<td></td>
<td>2 — 4</td>
<td></td>
<td>2 — 4</td>
<td></td>
</tr>
<tr>
<td>10.11—n Mathematics, Part I</td>
<td>2 — 1*</td>
<td></td>
<td>2 — 1*</td>
<td></td>
<td>2 — 1*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5½ — 6½</td>
<td></td>
<td>5½ — 6½</td>
<td></td>
<td>5½ — 6½</td>
<td></td>
</tr>
</tbody>
</table>

* Tutorial

151
### SECOND YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11 Physics, Part II</td>
<td>1½</td>
<td>1½</td>
<td>1½</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part II</td>
<td>1—2</td>
<td>1—2</td>
<td>1—2</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part II</td>
<td>2—1*</td>
<td>1—1*</td>
<td>1—1*</td>
</tr>
<tr>
<td>Materials for Leather Manufacture</td>
<td>1—2</td>
<td>1—3</td>
<td>1—1</td>
</tr>
<tr>
<td>Total</td>
<td>5½—6½</td>
<td>4½—7½</td>
<td>4½—5½</td>
</tr>
</tbody>
</table>

* Tutorial.

### THIRD YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.32 Physical Chemistry</td>
<td>1—0</td>
<td>1—0</td>
<td>1—2½</td>
</tr>
<tr>
<td>2.42 Inorganic Chemistry</td>
<td>1—2½</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>2.52 Quantitative Analysis</td>
<td>1—2½</td>
<td>1—2½</td>
<td>1—2½</td>
</tr>
<tr>
<td>2.62 Organic Chemistry</td>
<td>1—0</td>
<td>1—2½</td>
<td>1—0</td>
</tr>
<tr>
<td>2.72A Mathematical Chemistry</td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>Light and Heavy Leather Manufacture</td>
<td>2—½</td>
<td>1—1½</td>
<td>1—1½</td>
</tr>
<tr>
<td>Total</td>
<td>7—5½</td>
<td>6—6½</td>
<td>6—6½</td>
</tr>
</tbody>
</table>

### FOURTH YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.33 Physical Chemistry</td>
<td>1—2</td>
<td>1—2½</td>
<td>1—2½</td>
</tr>
<tr>
<td>2.53 Quantitative Analysis</td>
<td>1—2½</td>
<td>1—2½</td>
<td>1—2</td>
</tr>
<tr>
<td>2.63 Organic Chemistry</td>
<td>1—2½</td>
<td>1—2</td>
<td>1—2½</td>
</tr>
<tr>
<td>Science of Leather Chemistry</td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>Analytical Chemistry of Leather Manufacture</td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>Total</td>
<td>5—7</td>
<td>5—7</td>
<td>5—7</td>
</tr>
</tbody>
</table>
**FIFTH YEAR**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.34d Physical Chemistry or 2.64d Organic Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>17.13 Biochemistry</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Leather Laboratory</td>
<td>0 — 4½</td>
<td>0 — 4½</td>
<td>0 — 4½</td>
</tr>
<tr>
<td>Total</td>
<td>2 — 9½</td>
<td>2 — 9½</td>
<td>2 — 9½</td>
</tr>
</tbody>
</table>

**SIXTH YEAR**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.34d Physical Chemistry</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>2.64d Organic Chemistry, depending on the subject taken in the fifth year</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>17.13 Microbiology, Part I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Mycology of Leather</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Leather Project</td>
<td>0 — 6</td>
<td>0 — 6</td>
<td>0 — 6</td>
</tr>
<tr>
<td>Total</td>
<td>6 — 0</td>
<td>6 — 0</td>
<td>6 — 0</td>
</tr>
</tbody>
</table>

**ADDITIONAL FOR HONOURS**

Students desiring to take Honours must apply to the Head of the School of Chemistry not later than 31st December in the year in which the fifth year is completed. The programme of study will be taken over two part-time years.
CONVERSION COURSE IIc—APPLIED CHEMISTRY

Holders of a diploma in Chemistry who completed the course of study prior to 1934* are required to complete the following additional subjects to qualify for the degree of Bachelor of Science:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11 Physics, Part II</td>
<td>3</td>
</tr>
<tr>
<td>10.11 Mathematics, Part II</td>
<td>2</td>
</tr>
<tr>
<td>G13 English or G23 History or G33 Philosophy</td>
<td>2</td>
</tr>
<tr>
<td>G43 Economics or G53 Government or G63 Psychology</td>
<td></td>
</tr>
<tr>
<td>or G83 Sociology</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

In addition, a thesis must be presented which may involve advanced laboratory work, together with any special subjects prescribed in each case.

The student is required to attend full time for one academic year or for such other time as approved by the Professorial Board.

*Diplomates of later than 1954 who desire to qualify for the degree proceed with stage 6 of Course IIb1 or IIb3.
SCHOOL OF CHEMICAL ENGINEERING

The courses of Chemical Engineering, Industrial Chemistry and Food Technology are planned to give students a broad training in the fundamentals of science, chemistry and engineering, and knowledge of the engineering principles basic to design, construction and operation of plant and equipment.

The first year of the Chemical Engineering and Food Technology courses is identical with the first year of Applied Chemistry, Metallurgy, Fuel Technology and Textile Technology. In the first two years of the part-time courses given in the School of Chemical Engineering the work in chemistry, physics and mathematics is identical with that taken in the same years of the Applied Chemistry and Metallurgy part-time courses. Students in any one of these courses may, therefore, transfer from one to another without loss of standing, up to the end of the first year full-time, or second year part-time. In subsequent years students in the School of Chemical Engineering take, in addition to the fundamental studies, courses in mechanical, electrical, and chemical engineering and industrial chemistry.

COURSE III—CHEMICAL ENGINEERING

This course may be taken at Pass or Honours standard. The Pass course extends over four years of 34 weeks each and the Honours Course over five years.

The course in Chemical Engineering is closely linked with practical training in industry. Combined academic study and works practice is undertaken by Pass students in their fourth year, and by Honours students in their fifth year. During these years students attend the University on a part-time basis.

Students enrolled in any stage of the full-time degree course in 1956 will complete the syllabus as set out in the 1956 Calendar. Students enrolled in the first year of the full-time degree course in 1957 or thereafter will complete the syllabus set out hereunder.

FIRST YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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* Tutorial

155
**SECOND YEAR**
(34 weeks day course)

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**THIRD YEAR**
(34 weeks day course)

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<td>6.94 Electrical Engineering</td>
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† Includes Factory visits

**FOURTH YEAR**
(34 weeks part-time course)

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156
Honours

Students desiring to take Honours must apply to the Professor of Chemical Engineering not later than 31st December of the year in which the third year is completed. The fourth year of the Honours course is a full-time year, industrial training being undertaken in fifth year.

Candidates for Honours are required to complete the following programme in fourth and fifth years.

Fourth Year
(34 weeks day course)

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Fifth Year
(34 weeks part-time course)

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Course IIIa—Food Technology

Course IIIa may be taken at Pass or Honours standard. The Pass course extends over four years of 34 weeks each and the Honours course over five years. Combined academic study and practical training in the food industry is undertaken by Pass students in their fourth year, and by Honours students in their fifth year.
During these years students attend the University on a part-time basis. For the first year, students follow the same course as in full-time Chemical Engineering, and later specialize in methods of food preservation and related biological sciences.

Students enrolled in any stage of the full-time Food Technology degree course in 1956 will complete the syllabus as set out in the 1956 Calendar. Students enrolled in the first year of the full-time course in 1957 or thereafter will complete the syllabus as set out hereunder.

### First Year

(34 weeks day course)

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<tr>
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<td>2 — 0</td>
<td>1 — 3</td>
<td>0 — 0</td>
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* Tutorial

### Second Year

(34 weeks day course)

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<td>1 — 2</td>
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<td>1 — 2 1/2</td>
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<td>2.42 Inorganic Chemistry</td>
<td>1 — 0</td>
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<td>2.52A Quantitative Analysis</td>
<td>1 — 3</td>
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<td>1 — 0</td>
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<td>2.62 Organic Chemistry</td>
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<td>1 — 2 1/2</td>
<td>1 — 2 1/2</td>
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11 — 16  13 — 15 1/2  12 — 11 1/2
### Third Year

**(34 weeks day course)**

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<td>3.814 Food Technology I</td>
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<td>5.703 Mechanical Engineering</td>
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### Fourth Year

**(34 weeks part-time course)**

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### Honours

Students desiring to take Honours must apply to the Professor of Chemical Engineering not later than 31st December of the year in which the third year is completed. The fourth year of the Honours course is a full-time year, industrial training being undertaken in fifth year.

Candidates for Honours are required to complete the following programme in fourth and fifth years.
### FOURTH YEAR

(34 weeks day course)

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### FIFTH YEAR

(34 weeks part-time course)

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### COURSE IIIb1—CHEMICAL ENGINEERING

Course IIIb1 has been designed for students in appropriate employment in the chemical industry. The programme of study is equivalent to that of Course III but in Course IIIb1 attendance is required over seven part-time years for a Pass degree and over eight part-time years for an Honours degree.

### FIRST YEAR

(34 weeks part-time course)

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<td>1½ — 1½</td>
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<td>2 — 1*</td>
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* Tutorial
### Second Year

(34 weeks part-time course)

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* Tutorial

### Third Year

(34 weeks part-time course)

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<td>1½—1½</td>
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<tr>
<td>2.42 Inorganic Chemistry</td>
<td>1—2½</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>2.62 Organic Chemistry</td>
<td>1—0</td>
<td>1—2½</td>
<td>1—0</td>
</tr>
<tr>
<td>8.132 Theory of Structures</td>
<td>1—2</td>
<td>1—1</td>
<td>1—1</td>
</tr>
<tr>
<td>8.92d Properties of Materials</td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>10.22 Mathematics</td>
<td>6½—4½</td>
<td>6½—5</td>
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</table>

### Fourth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
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<th>Term 3</th>
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<tbody>
<tr>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td>2.33 Physical Chemistry</td>
<td>1—2</td>
<td>1—2½</td>
<td>1—2½</td>
</tr>
<tr>
<td>2.52a Quantitative Analysis</td>
<td>1—3</td>
<td>1—2</td>
<td>1—0</td>
</tr>
<tr>
<td>2.63 Organic Chemistry</td>
<td>1—2½</td>
<td>1—2</td>
<td>1—2½</td>
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<tr>
<td>10.23 Mathematics</td>
<td>2—0</td>
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<td>2—0</td>
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<tr>
<td></td>
<td>5—7½</td>
<td>5—6½</td>
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</table>

* 54990—6  K 5137  161
### FIFTH YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
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<th>Term 2</th>
<th>Term 3</th>
</tr>
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<tr>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>3.14 Industrial Chemistry†</td>
<td>1 ½ — 2 ½</td>
<td>1 ½ — 2 ½</td>
<td>1 ½ — 2 ½</td>
</tr>
<tr>
<td>3.44 Chemical Engineering Calculations</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>5.703 Mechanical Engineering</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>2 — 1</td>
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<tr>
<td>6.94 Electrical Engineering</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
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<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>6 ½ — 5 ½</td>
<td>6 ½ — 5 ½</td>
<td>6 ½ — 5 ½</td>
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</table>

† Includes Factory visits

### SIXTH YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
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<th>Term 3</th>
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</thead>
<tbody>
<tr>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
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<td>3.24d Chemical Engineering Unit Operations</td>
<td>3 — 2 ½</td>
<td>3 — 2 ½</td>
<td>3 — 2 ½</td>
</tr>
<tr>
<td>3.34d Chemical Engineering Design ...</td>
<td>2 — 2 ½</td>
<td>2 — 2 ½</td>
<td>2 — 2 ½</td>
</tr>
<tr>
<td>3.54 Chemical Engineering Materials</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
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<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
<td></td>
<td>7 — 5</td>
<td>7 — 5</td>
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### SEVENTH YEAR

(34 weeks part-time course)

<table>
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</thead>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>G13 English or G23 History</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>G43 Economics or G63 Psychology or G83 Sociology</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G50.1 Government</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
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<table>
<thead>
<tr>
<th></th>
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<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
<td></td>
<td>6 — 0</td>
<td>6 — 0</td>
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</table>
ADDITIONAL FOR HONOURS.

Students desiring to take Honours must apply to the Professor of Chemical Engineering not later than 31st December of the year in which the sixth year is completed. The undermentioned additional courses must be taken. The first year of the additional work may be combined with the normal seventh year or taken separately. In either case two years part-time attendance is required.

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
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<th>Term 3</th>
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<tr>
<td>3.25 Chemical Engineering Unit Operations</td>
<td>4 — 3</td>
<td>4 — 3</td>
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<tr>
<td>3.35 Advanced Chemical Engineering Design</td>
<td>2 — 3</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
<tr>
<td>3.75 Chemical Engineering Project...</td>
<td>1 — 0</td>
<td>1 — 0</td>
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<td>3.55 Chemical Engineering Materials</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
</tr>
<tr>
<td>3.65 Chemical Engineering Thermo-dynamics and Kinetics</td>
<td>2 — 3</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
<tr>
<td>6.95 Electrical Engineering</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
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</table>

COURSE IIIb2—INDUSTRIAL CHEMISTRY

The part-time course in Industrial Chemistry provides instruction for students in appropriate employment in the chemical industry, and allows for specialization in industrial chemistry, paint technology, plastics and rubber technology, or in ceramics technology.

The course is of six years' duration and leads to the award of the degree of Bachelor of Science. In the case of the industrial chemistry specialization, an Honours degree may be awarded on the results of an extra years' study.

The first three years of the course, which are common to all four specializations, provide a sound general background of fundamental sciences, with particular emphasis on analytical chemistry. In the later years students take the subjects appropriate to their chosen field of specialization.

FIRST YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11 Physics, Part I</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part I</td>
<td>2 — 1*</td>
<td>2 — 1*</td>
<td>2 — 1*</td>
</tr>
<tr>
<td></td>
<td>5½—6½</td>
<td>5½—6½</td>
<td>5½—6½</td>
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</table>

* Tutorial
### Second Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
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<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td><strong>1.11 Physics, Part II</strong></td>
<td>1½</td>
<td>1½</td>
<td>1½</td>
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<tr>
<td><strong>2.41 General Chemistry, Part II</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>5.101 Engineering Drawing and</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Materials</strong></td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td><strong>10.11-b Mathematics, Part II</strong></td>
<td>1*</td>
<td>1*</td>
<td>1*</td>
</tr>
<tr>
<td></td>
<td>6½</td>
<td>4½</td>
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</table>

* Tutorial

### Third Year

(34 weeks part-time course)

<table>
<thead>
<tr>
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<th>Term 3</th>
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<tr>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td><strong>2.23 Chemical Instrumentation</strong>*</td>
<td>1</td>
<td>1½</td>
<td>1½</td>
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<tr>
<td><strong>2.32 Physical Chemistry</strong></td>
<td>1</td>
<td>0</td>
<td>2½</td>
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<tr>
<td><strong>2.42 Inorganic Chemistry</strong></td>
<td>1</td>
<td>2½</td>
<td>0</td>
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<tr>
<td><strong>2.52 Quantitative Analysis</strong></td>
<td>1</td>
<td>2½</td>
<td>2½</td>
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<tr>
<td><strong>2.62 Organic Chemistry</strong></td>
<td>1</td>
<td>0</td>
<td>2½</td>
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<tr>
<td><strong>2.72 Mathematical Chemistry</strong></td>
<td>1</td>
<td>0</td>
<td>0</td>
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<tr>
<td></td>
<td>6</td>
<td>6½</td>
<td>6½</td>
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</table>

* Alternative subject for Industrial Chemistry option—

**1.92 Physics**                       | 1½  | 0      | 1½  |

### Industrial Chemistry Specialization

### Fourth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tr>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td><strong>2.33 Physical Chemistry</strong></td>
<td>1</td>
<td>2</td>
<td>2½</td>
</tr>
<tr>
<td><strong>2.53 Quantitative Analysis</strong></td>
<td>1</td>
<td>2½</td>
<td>2</td>
</tr>
<tr>
<td><strong>2.73 Mathematical Chemistry</strong></td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>3.14 Industrial Chemistry</strong></td>
<td>1½</td>
<td>2½</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>4½</td>
<td>7</td>
<td>4½</td>
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</table>
**Fifth Year**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
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<th>Term 2</th>
<th>Term 3</th>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td>2.34 Physical Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
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<tr>
<td>3.15 Industrial Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
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<tr>
<td>3.44 Chemical Engineering Calculations</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>3.54 Chemical Engineering Materials</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td><strong>6 — 6</strong></td>
<td><strong>6 — 6</strong></td>
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**Sixth Year**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>G13 English or G23 History</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>G43 Economics or G63 Psychology or G83 Sociology</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G50.1 Government</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td></td>
<td><strong>6 — 0</strong></td>
<td><strong>6 — 0</strong></td>
<td><strong>6 — 0</strong></td>
</tr>
</tbody>
</table>

**Additional for Honours**

Students specializing in industrial chemistry desiring to take Honours must apply to the Professor of Chemical Engineering not later than 31st December of the year in which the fifth year is completed. The undermentioned additional courses must be taken. Portion of the additional work may be combined with the normal sixth year and the remainder completed in the seventh year.

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td>3.55 Chemical Engineering Materials</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Industrial Safety (General)</td>
<td>1½ — 0</td>
<td>1½ — 0</td>
<td>1½ — 0</td>
</tr>
<tr>
<td>Advanced Industrial Chemistry</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
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<tr>
<td>Industrial Chemistry Project</td>
<td>0 — 12</td>
<td>0 — 12</td>
<td>0 — 12</td>
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</table>
PAINT TECHNOLOGY SPECIALIZATION

Students specializing in paint technology will complete the first three years as set out above and undertake the following programme in fourth, fifth and sixth years.

**FOURTH YEAR**

(34 weeks part-time course)

Hours per week

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td>2.33 Physical Chemistry</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>2.63 Organic Chemistry</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>3.511 Paint and Varnish Manufacture I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>3.531 Paint Quality Control</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
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**FIFTH YEAR**

(34 weeks part-time course)

Hours per week

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
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<th>Term 2</th>
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</thead>
<tbody>
<tr>
<td>2.64 Organic Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>3.514 Pigment and Dyestuffs</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
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<tr>
<td>3.521 Polymerisation I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
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<tr>
<td>Humanities</td>
<td>3 — 0</td>
<td>3 — 0</td>
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**SIXTH YEAR**

(34 weeks part-time course)

Hours per week

<table>
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<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td>3.512 Paint and Varnish Manufacture II</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>3.522 Polymerisation II</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>10.73 Statistics</td>
<td>3 — 0</td>
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<td>3 — 0</td>
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<tr>
<td>Professional Elective</td>
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<td>3 — 0</td>
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<tr>
<td>Humanities</td>
<td>9 — 4</td>
<td>9 — 4</td>
<td>9 — 4</td>
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</tbody>
</table>

*As set out on p. 165 for the industrial chemistry specialization.*
PLASTICS AND RUBBER TECHNOLOGY SPECIALIZATION

Students specializing in plastics and rubber technology will complete the first three years as set out above and undertake the following programme in their fourth, fifth and sixth years.

### FOURTH YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
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<th>Term 3</th>
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<tr>
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<td>1 — 2½</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
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<tr>
<td>Organic Chemistry</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>Plastics and Rubber Technology</td>
<td>2 — 3</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
<tr>
<td>Statistics</td>
<td>1 — 0</td>
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<tr>
<td></td>
<td>5 — 8</td>
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</table>

### FIFTH YEAR

(34 weeks part-time course)

<table>
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<th>Term 2</th>
<th>Term 3</th>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td>Organic Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>Polymerisation I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Plastics and Rubber Technology</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
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<td>Humanities*</td>
<td>3 — 0</td>
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<td></td>
<td>8 — 5</td>
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### SIXTH YEAR

(34 weeks part-time course)

<table>
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<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td></td>
</tr>
<tr>
<td>Plastics and Rubber Technology</td>
<td>2 — 5</td>
<td>2 — 5</td>
<td>2 — 5</td>
</tr>
<tr>
<td>Professional Elective</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
</tr>
<tr>
<td>Humanities*</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
</tr>
<tr>
<td></td>
<td>8 — 5</td>
<td>8 — 5</td>
<td>8 — 5</td>
</tr>
</tbody>
</table>

* As set out on p. 165 for the industrial chemistry specialization.
INDUSTRIAL CERAMICS SPECIALIZATION

Students specializing in industrial ceramics will complete the first three years as set out above and undertake the following programme in their fourth, fifth and sixth years.

FOURTH YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.33</td>
<td>Physical Chemistry</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>2.53</td>
<td>Quantitative Analysis</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>3.411</td>
<td>Ceramics I</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>7.502</td>
<td>Geology</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 — 8</td>
<td>5 — 8</td>
<td>5 — 8</td>
</tr>
</tbody>
</table>

FIFTH YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.34</td>
<td>Physical Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>3.412</td>
<td>Ceramics II</td>
<td>2 — 2</td>
<td>2 — 2</td>
</tr>
<tr>
<td>7.512</td>
<td>Mineralogy and Crystallography</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Humanities*</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 — 7</td>
<td>6 — 7</td>
<td>6 — 7</td>
</tr>
</tbody>
</table>

SIXTH YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.413</td>
<td>Ceramics III</td>
<td>4 — 3</td>
<td>4 — 3</td>
</tr>
<tr>
<td>3.421</td>
<td>Clay Mineralogy</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Humanities*</td>
<td>4 — 0</td>
<td>4 — 0</td>
<td>4 — 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 — 3</td>
<td>9 — 3</td>
<td>9 — 3</td>
</tr>
</tbody>
</table>

As set out on p. 166 for the industrial chemistry specialization.
COURSE IIIb3—FOOD TECHNOLOGY

This course has been designed for students already gaining practical experience in a related occupation in the food industry. The course extends over seven years for a Pass degree and over eight years for an Honours degree.

Students in this course follow the same syllabus as chemical engineering students for the first three years and thereafter specialize in methods of food preservation. A study is also made of the biological sciences, a knowledge of which is necessary for the successful plant control of a food industry.

FIRST YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.11 Physics, Part I</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
<tr>
<td>10.11—n Mathematics, Part I</td>
<td>2 — 1*</td>
<td>2 — 1*</td>
<td>2 — 1*</td>
</tr>
<tr>
<td></td>
<td>5½—6½</td>
<td>5½—6½</td>
<td>5½—6½</td>
</tr>
</tbody>
</table>

* Tutorial

SECOND YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.11 Physics, Part II</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part II</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>5.101 Engineering Drawing and Materials</td>
<td>2 — 0</td>
<td>1 — 3</td>
<td>0 — 0</td>
</tr>
<tr>
<td>5.211 Workshop Processes and Practice</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>0 — 3</td>
</tr>
<tr>
<td>10.11—n Mathematics, Part II</td>
<td>2 — 1*</td>
<td>1 — 1*</td>
<td>1 — 1*</td>
</tr>
<tr>
<td></td>
<td>6½—4½</td>
<td>4½—7½</td>
<td>3½—7½</td>
</tr>
</tbody>
</table>

* Tutorial
### Third Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Term 1</strong> lec. lab./tut.</td>
<td><strong>Term 2</strong> lec. lab./tut.</td>
</tr>
<tr>
<td>2.32 Physical Chemistry</td>
<td>1 — 0</td>
</tr>
<tr>
<td>2.42 Inorganic Chemistry</td>
<td>1 — 2 1/2</td>
</tr>
<tr>
<td>2.52A Quantitative Analysis</td>
<td>1 — 3</td>
</tr>
<tr>
<td>2.62 Organic Chemistry</td>
<td>1 — 0</td>
</tr>
<tr>
<td>10.22 Mathematics</td>
<td>1 — 0</td>
</tr>
<tr>
<td>10.73 Statistics</td>
<td>1 — 0</td>
</tr>
<tr>
<td>17.30 Industrial Botany</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.40 Industrial Entomology</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7 — 7 1/2</strong></td>
</tr>
</tbody>
</table>

### Fourth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Term 1</strong> lec. lab./tut.</td>
<td><strong>Term 2</strong> lec. lab./tut.</td>
</tr>
<tr>
<td>2.33 Physical Chemistry</td>
<td>1 — 2</td>
</tr>
<tr>
<td>2.63 Organic Chemistry</td>
<td>1 — 2 1/2</td>
</tr>
<tr>
<td>17.13 Biochemistry</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.51 Microbiology</td>
<td>1 — 2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4 — 8 1/2</strong></td>
</tr>
</tbody>
</table>

### Fifth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Term 1</strong> lec. lab./tut.</td>
<td><strong>Term 2</strong> lec. lab./tut.</td>
</tr>
<tr>
<td>2.65B Applied Organic Chemistry</td>
<td>1 — 3</td>
</tr>
<tr>
<td>(Chemistry and Analysis of Food)</td>
<td></td>
</tr>
<tr>
<td>3.814 Food Technology I</td>
<td>1 — 2</td>
</tr>
<tr>
<td>5.703 Mechanical Engineering</td>
<td>2 — 1</td>
</tr>
<tr>
<td>17.52 Microbiology</td>
<td>1 — 2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5 — 8</strong></td>
</tr>
</tbody>
</table>

### Sixth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Term 1</strong> lec. lab./tut.</td>
<td><strong>Term 2</strong> lec. lab./tut.</td>
</tr>
<tr>
<td>3.24D Chemical Engineering Unit Operations</td>
<td>3 — 2 1/2</td>
</tr>
<tr>
<td>3.824 Food Technology II</td>
<td>2 — 4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5 — 6 1/2</strong></td>
</tr>
</tbody>
</table>
SEVENTH YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G13 English or G23 History</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>G43 Economics or G63 Psychology or G83 Sociology</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G50.1 Government</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td></td>
<td>6 — 0</td>
<td>6 — 0</td>
<td>6 — 0</td>
</tr>
</tbody>
</table>

ADDITIONAL FOR HONOURS

Students desiring to take Honours must apply to the Professor of Chemical Engineering not later than 31st December of the year in which the sixth year is completed. The undermentioned additional courses must be taken. Portion of the additional work may be combined with the normal seventh year and the remainder completed in the eighth year.

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.54 Chemical Engineering Materials</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3.834 Advanced Food Technology</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>3.85 Food Technology Project</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

CONVERSION COURSE IIIc—CHEMICAL ENGINEERING

Holders of a diploma in Chemical Engineering who completed the course of study prior to 1954* are required to complete the following additional work in order to qualify for the degree of Bachelor of Science.

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11 Physics, Part II</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>10.11 Mathematics, Part II</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>G13 English or G23 History or G33 Philosophy</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>G43 Economics or G53 Government or G63 Psychology or G83 Sociology</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

In addition, advanced laboratory work on a specified project is to be carried out and a thesis must be presented. Successful completion of special subjects which may be prescribed in individual cases is also required.

The student is required to attend either for one full-time academic year in accordance with the dates prescribed for the normal final year of the undergraduate course, or for such other time as approved by the Professorial Board.

* Diplomates of later than 1954 who desire to qualify for the degree proceed with Stage 7 of Course IIIb1 or IIIb3.
SCHOOL OF METALLURGY

The courses in metallurgy have been designed to prepare students for employment in metallurgical industries and research institutions and involve a general training in basic sciences and engineering. These fundamental principles are then applied to problems relating to the extraction, refining, working, fabrication and use of metals.

Two main courses in metallurgy are available. In Course IV, which leads to the degree of Bachelor of Science or Bachelor of Science (Honours), students study full-time during the day and may complete the course in four years. Between the third and fourth years they are expected to obtain a full-time position in industry. Course IVB, which leads to the degree of Bachelor of Science, is primarily for students employed in metallurgical industries, and instruction is given mainly in the evenings, although at least one half-day per week release from employment is necessary during term.

The first year of the full-time Metallurgy course is identical with the first year of Applied Chemistry, Chemical Engineering, Food Technology, Fuel Technology and Textile Technology. In the first two years of the part-time course the work in mathematics, physics and chemistry is identical with that taken in the same years of the Applied Chemistry, Chemical Engineering, Food Technology and Industrial Chemistry part-time courses. Students in any of these courses may, therefore, transfer from one to another without loss of standing, up to the end of the first year full-time, or second year part-time.

COURSE IV—METALLURGY

This course extends over four years and students study full-time during the day as follows:—

First Three Years—34 weeks over three terms from late February to November (excluding examinations and vacations) of full-time study, five days per week.

Fourth Year—22 weeks over two terms from early June (excluding examinations and vacations) of full-time day study, five days per week.

As will be seen above, the fourth year of the course commences at the beginning of the second University term so as to provide a six-month period between the third and fourth years in which a student must obtain industrial experience. Lectures and laboratory work cease during this period so that students may travel to other centres for their industrial training.
Provision is made in the course for a limited amount of specialization of the student's own choice in the final year.

Candidates for the Honours degree will be expected to undertake more extensive reading and other assignments, as directed by the Head of the School. In the grading of degrees special attention will be paid to the performance of the candidate in the final-year research project.

**First Year**

(34 weeks day course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.11 Physics</td>
<td>3 - 3</td>
<td>3 - 3</td>
<td>3 - 3</td>
</tr>
<tr>
<td>2.41 General Chemistry</td>
<td>3 - 6</td>
<td>3 - 6</td>
<td>3 - 6</td>
</tr>
<tr>
<td>5.101 Engineering Drawing and Materials</td>
<td>2 - 0</td>
<td>1 - 3</td>
<td>0 - 0</td>
</tr>
<tr>
<td>5.211 Workshop Processes and Practice</td>
<td>0 - 0</td>
<td>0 - 0</td>
<td>0 - 3</td>
</tr>
<tr>
<td>10.11 Mathematics</td>
<td>4 - 2</td>
<td>4 - 2</td>
<td>0 - 0</td>
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<tr>
<td>10.11.8 Mathematics</td>
<td>0 - 0</td>
<td>0 - 0</td>
<td>2 - 2</td>
</tr>
<tr>
<td>G1 English</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>0 - 0</td>
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<tr>
<td>G20 History</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15 - 11</td>
<td>14 - 14</td>
<td>10 - 14</td>
</tr>
</tbody>
</table>

**Second Year**

(34 weeks day course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.92 Physics</td>
<td>1½ - 0</td>
<td>1½ - 1½</td>
<td>1½ - 1½</td>
</tr>
<tr>
<td>2.32 Physical Chemistry</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 2½</td>
</tr>
<tr>
<td>2.42b Inorganic Chemistry</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>2.52 Quantitative Analysis</td>
<td>1 - 2½</td>
<td>1 - 2½</td>
<td>1 - 2½</td>
</tr>
<tr>
<td>2.72 Mathematical Chemistry</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>4.12 General Metallurgy</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>4.22 Metallurgical Engineering I</td>
<td>2 - 2½ - 1*</td>
<td>2 - 2½ - 1*</td>
<td>2 - 2½ - 1*</td>
</tr>
<tr>
<td>4.32 Physical Metallurgy I</td>
<td>1 - 3</td>
<td>2 - 3</td>
<td>2 - 3</td>
</tr>
<tr>
<td>7.612 Mineralogy</td>
<td>1 - 1½</td>
<td>1 - 1½</td>
<td>1 - 0</td>
</tr>
<tr>
<td>8.912 Properties of Materials</td>
<td>1 - 1½</td>
<td>1 - 1½</td>
<td>0 - 0</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>0 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12½ - 11½</td>
<td>14½ - 13½</td>
<td>12½ - 13</td>
</tr>
</tbody>
</table>

* Tutorial
† Includes one hour report writing
## Third Year

(34 weeks day course)

<table>
<thead>
<tr>
<th></th>
<th>Term 1 lec. lab./tut.</th>
<th>Term 2 lec. lab./tut.</th>
<th>Term 3 lec. lab./tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.33 Physical Chemistry</td>
<td>1 — 2</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>2.73 Mathematical Chemistry</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>4.23 Metallurgical Engineering II</td>
<td>4 — 3</td>
<td>4 — 3</td>
<td>4 — 5</td>
</tr>
<tr>
<td>4.33 Physical Metallurgy II</td>
<td>2 — 3½</td>
<td>2 — 3½</td>
<td>2 — 3½</td>
</tr>
<tr>
<td>4.54 Metallurgy Seminar, Part I</td>
<td>0 — 1*</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>6.83d Electrical Engineering</td>
<td>1 — 1½</td>
<td>1 — 1½</td>
<td>1 — 1½</td>
</tr>
<tr>
<td>7.034 Mineral Dressing</td>
<td>2 — 3</td>
<td>2 — 3</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 — 14</td>
<td>13 — 13½</td>
<td>9 — 12½</td>
</tr>
</tbody>
</table>

* Discussion on report and paper presentation. Seminars will be conducted jointly by part-time students in sixth year and full-time students in fourth year.

## Fourth Year

(22 weeks day course)

2nd and 3rd terms only—Vacation and 1st term in industry

<table>
<thead>
<tr>
<th></th>
<th>Term 2 lec. lab./tut.</th>
<th>Term 3 lec. lab./tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.24 Metallurgical Engineering III</td>
<td>2 — 3</td>
<td>2 — 0</td>
</tr>
<tr>
<td>4.34 Physical Metallurgy III</td>
<td>2 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>4.44 Industrial Metallurgy</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
<tr>
<td>4.54 Metallurgy Seminar, Part II</td>
<td>0 — 2*</td>
<td>0 — 2†</td>
</tr>
<tr>
<td>4.64 Metallurgy Project</td>
<td>0 — 6†</td>
<td>0 — 12†</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 — 17†</td>
<td>7 — 20†</td>
</tr>
</tbody>
</table>

* Taken jointly with sixth year students in part-time course.
† Portion of this period will be used for discussion of "industrial experience" reports.

During the second, third and fourth years of the course, excursions will be made to various metallurgical works. Detailed reports of some of these visits will be required.

A detailed report of the student's activities during his six-month period in industry after the third year will be required, and will be taken into consideration during classification for the Honours list.
COURSE IVb—METALLURGY

The part-time course, which leads to the degree of Bachelor of Science, extends over seven years of three terms each. Students are required to have at least three years' experience in a metallurgical industry or institution before completing the course.

**FIRST YEAR**
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td></td>
</tr>
<tr>
<td>1.11 Physics, Part I</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
<td>$2$</td>
<td>$2$</td>
<td>$2$</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part I</td>
<td>$2 - 1^*$</td>
<td>$2 - 1^*$</td>
<td>$2 - 1^*$</td>
</tr>
<tr>
<td></td>
<td>$6\frac{1}{2}$</td>
<td>$6\frac{1}{2}$</td>
<td>$6\frac{1}{2}$</td>
</tr>
</tbody>
</table>

* Tutorial

**SECOND YEAR**
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td></td>
</tr>
<tr>
<td>1.11 Physics, Part II</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part II</td>
<td>$1 - 2$</td>
<td>$1 - 2$</td>
<td>$1 - 2$</td>
</tr>
<tr>
<td>5.101 Engineering Drawing and Materials</td>
<td>$2 - 0$</td>
<td>$1 - 3$</td>
<td>$0 - 0$</td>
</tr>
<tr>
<td>5.211 Workshop Processes and Practice</td>
<td>$0 - 0$</td>
<td>$0 - 0$</td>
<td>$0 - 3$</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part II</td>
<td>$2 - 1^*$</td>
<td>$1 - 1^*$</td>
<td>$1 - 1^*$</td>
</tr>
<tr>
<td></td>
<td>$6\frac{1}{2}$</td>
<td>$4\frac{1}{2}$</td>
<td>$7\frac{1}{2}$</td>
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</table>

* Tutorial

**THIRD YEAR**
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td></td>
</tr>
<tr>
<td>1.92 Physics</td>
<td>$1 - 0$</td>
<td>$1\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
</tr>
<tr>
<td>2.32 Physical Chemistry</td>
<td>$1 - 2\frac{1}{2}$</td>
<td>$1 - 0$</td>
<td>$1 - 0$</td>
</tr>
<tr>
<td>2.52 Quantitative Analysis</td>
<td>$1 - 2\frac{1}{2}$</td>
<td>$1 - 2\frac{1}{2}$</td>
<td>$1 - 2\frac{1}{2}$</td>
</tr>
<tr>
<td>2.72 Mathematical Chemistry</td>
<td>$1 - 0$</td>
<td>$1 - 0$</td>
<td>$1 - 0$</td>
</tr>
<tr>
<td>4.12 General Metallurgy</td>
<td>$2 - 0$</td>
<td>$1 - 0$</td>
<td>$0 - 0$</td>
</tr>
<tr>
<td>8.912 Properties of Materials (equivalent time)</td>
<td>$1 - 1\frac{1}{2}$</td>
<td>$1 - 1\frac{1}{2}$</td>
<td>$0 - 0$</td>
</tr>
<tr>
<td></td>
<td>$7\frac{1}{2}$</td>
<td>$6\frac{1}{2}$</td>
<td>$5\frac{1}{2}$</td>
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</tbody>
</table>

175
### Fourth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Name</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.33</td>
<td>Physical Chemistry</td>
<td>1-1</td>
<td>1-1</td>
<td>1-1</td>
</tr>
<tr>
<td>2.42D</td>
<td>Inorganic Chemistry</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>2.73</td>
<td>Mathematical Chemistry</td>
<td>1-0</td>
<td>2-3</td>
<td>2-3</td>
</tr>
<tr>
<td>4.32</td>
<td>Physical Metallurgy I</td>
<td>1-1</td>
<td>1-1</td>
<td>1-0</td>
</tr>
<tr>
<td>7.612D</td>
<td>Mineralogy</td>
<td>6-5</td>
<td>6-5</td>
<td>6-4</td>
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</table>

### Fifth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Name</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.22</td>
<td>Metallurgical Engineering I</td>
<td>2-2†</td>
<td>2-2†</td>
<td>2-2†</td>
</tr>
<tr>
<td>4.33</td>
<td>Physical Metallurgy II</td>
<td>2-3</td>
<td>2-3</td>
<td>2-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4-6‡</td>
<td>4-7</td>
<td>4-7</td>
</tr>
</tbody>
</table>

* Tutorial
† Includes one hour report writing

### Sixth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Name</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.23</td>
<td>Metallurgical Engineering IIa</td>
<td>2-3</td>
<td>2-3</td>
<td>2-5</td>
</tr>
<tr>
<td></td>
<td>and Project</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.44a</td>
<td>Industrial Metallurgy*</td>
<td>2-1</td>
<td>2-1</td>
<td>1-0</td>
</tr>
<tr>
<td>4.54</td>
<td>Metallurgy Seminar†</td>
<td>1-0</td>
<td>0-2</td>
<td>0-0</td>
</tr>
<tr>
<td>4.23</td>
<td>Metallurgical Engineering IIb</td>
<td>2-0</td>
<td>2-0</td>
<td>2-0</td>
</tr>
<tr>
<td></td>
<td>or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.83d</td>
<td>Electrical Engineering</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
</tbody>
</table>

* Includes Factory visits
† Report and paper presentation covered in first term, then joint seminar in second term with full-time students
SEVENTH YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G13 English or G23 History</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>G43 Economics or G63 Psychology or G83 Sociology</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>G50.1 Government</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

CONVERSION COURSES—METALLURGY

Students who hold current diplomas of the Sydney Technical College in Metallurgy (Newcastle or Wollongong) or Secondary Metallurgy (Sydney) may apply for permission to take a conversion course which will enable them to qualify for the degree of Bachelor of Science. Details of the conversion courses are as shown below—

CONVERSION COURSE IVc1—METALLURGY

Conversion course to Bachelor of Science from Secondary Metallurgy diploma course (Sydney).

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.92 Physics</td>
<td>2\frac{1}{2}</td>
</tr>
<tr>
<td>2.72 Mathematical Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>2.73 Mathematical Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>4.54 Metallurgy Seminar</td>
<td>1</td>
</tr>
<tr>
<td>G13 English or G23 History or G33 Philosophy</td>
<td>2</td>
</tr>
<tr>
<td>G43 Economics or G53 Government or G63 Psychology or G83 Sociology</td>
<td>2</td>
</tr>
</tbody>
</table>

Together with any special subjects prescribed.
CONVERSION COURSE IVc2—METALLURGY

Conversion course to Bachelor of Science from Metallurgy diploma course (Newcastle and Wollongong).

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.42d Physics</td>
<td>3½</td>
</tr>
<tr>
<td>2.72 Mathematical Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>2.73 Mathematical Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>4.54 Metallurgy Seminar</td>
<td>1</td>
</tr>
<tr>
<td>G13 English or G23 History or G33 Philosophy</td>
<td>2</td>
</tr>
<tr>
<td>G43 Economics or G53 Government or G63 Psychology or G83 Sociology</td>
<td>2</td>
</tr>
</tbody>
</table>

Together with any special subjects prescribed.
SCHOOL OF MECHANICAL ENGINEERING

The School of Mechanical Engineering offers degree courses in mechanical engineering and naval architecture.

The courses in mechanical engineering are planned to provide a sufficient foundation of basic science applied to engineering methods and techniques to prepare the graduate to enter any industry dealing with heat, power, materials and machinery. The course does not attempt to teach current commercial practice nor specialised knowledge of the product of any one industry. On the contrary, undergraduates are expected to obtain their practical experience by direct service in industry.

In general, instruction by lectures is paralleled by laboratory work in which the student is given opportunity, not only to familiarise himself with materials, engines and machinery, but also to develop his ability to apply theory to the analysis of their characteristics.

The course in naval architecture is based on the part-time mechanical engineering course with the advanced mechanical engineering subjects being replaced by naval architecture.

Two courses in mechanical engineering are provided leading to the degree of Bachelor of Engineering (pass or honours); Course V, a four year day course, and Course VB, a part-time course extending over seven years.

One course in naval architecture is offered leading to the degree of Bachelor of Engineering; Course VB1, a part-time course extending over seven years.

COURSE V—MECHANICAL ENGINEERING

Course V is of four years' duration. The first three years of the course each require attendance at the University for twenty-four weeks. For the remainder of each of these years the student gains practical experience in industry. The fourth year requires full-time day attendance for thirty-four weeks.
During the first two years the fundamental subjects which are the basis of the student's later professional work are studied, viz., mathematics, chemistry, physics and applied mechanics, a thorough knowledge of which is essential in all branches of mechanical engineering. The student is also trained in elements of the more important mechanical processes in order that he may acquire the knowledge of modern machine tools, foundry practice, forging and welding, necessary for the successful designer of machinery. This knowledge is further enlarged by three periods in industry between the various academic sessions. The first two periods are spent in engineering workshops and the third in a drawing office.

The professional work of the third and fourth years includes the study of the mechanics of fluids and of rigid and elastic bodies with applications to design. The study of thermodynamics is applied to heat engineering, and to the analysis and design of power plants, turbines, steam and internal combustion engines, industrial heating, and to refrigeration and air-conditioning systems. Engineering processes are considered in relation to design for production; and work on metrology, gauges and fixtures, tool design, tolerances and inspection is introduced.

The professional elective subjects in the fourth year permit students to choose a broad phase of mechanical engineering as a special study. In this way the student learns to use libraries and technical journals, and is made to realise how fully the knowledge he has gained during his course is used in engineering development and practice. The preparation of a thesis provides a training in report-writing and in technical exposition.

**First Year**

(24 weeks day course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>llec. lab./tut.</td>
<td>llec. lab./tut.</td>
<td>llec. lab./tut.</td>
</tr>
<tr>
<td>1.41 Physics</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2.11 Chemistry</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5.11 Engineering Drawing</td>
<td>0-3*</td>
<td>0-3*</td>
</tr>
<tr>
<td>5.21 Mechanical Technology</td>
<td>2½</td>
<td>0</td>
</tr>
<tr>
<td>5.41 Descriptive Geometry</td>
<td>1</td>
<td>2½*</td>
</tr>
<tr>
<td>8.11 Engineering Mechanics</td>
<td>1</td>
<td>1*</td>
</tr>
<tr>
<td>10.11 Mathematics</td>
<td>4</td>
<td>2*</td>
</tr>
<tr>
<td>G10 English</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

* Tutorial

180
### Second Year

(24 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td><strong>Term 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lec. lab./tut.</td>
<td>1.42</td>
<td>2 — 2½</td>
</tr>
<tr>
<td><strong>Term 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lec. lab./tut.</td>
<td>4.92</td>
<td>2 — 2½</td>
</tr>
<tr>
<td><strong>Mechanical Technology</strong></td>
<td>5.22</td>
<td>2 — 2½</td>
</tr>
<tr>
<td><strong>Thermodynamics</strong></td>
<td>5.32</td>
<td>3 — 0</td>
</tr>
<tr>
<td><strong>Fluid Mechanics</strong></td>
<td>5.52</td>
<td>3 — 0</td>
</tr>
<tr>
<td><strong>Theory of Structures</strong></td>
<td>8.12</td>
<td>4.912</td>
</tr>
<tr>
<td><strong>Properties of Materials</strong></td>
<td>8.92</td>
<td>5.22</td>
</tr>
<tr>
<td><strong>Mathematics</strong></td>
<td>10.12</td>
<td>5.32</td>
</tr>
<tr>
<td><strong>History</strong></td>
<td>G20</td>
<td>5.52</td>
</tr>
</tbody>
</table>

| Total                          | 16½—14 | 17½—13½ |

* Tutorial

---

### Third Year

(24 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>lec. lab./tut.</td>
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<tr>
<td><strong>Term 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lec. lab./tut.</td>
<td>5.12</td>
<td>0 — 3*</td>
</tr>
<tr>
<td><strong>Term 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lec. lab./tut.</td>
<td>5.23</td>
<td>2 — 0</td>
</tr>
<tr>
<td><strong>Theory of Machines</strong></td>
<td>5.33</td>
<td>1½ — 1*</td>
</tr>
<tr>
<td><strong>Fluid Mechanics</strong></td>
<td>5.53</td>
<td>1 — 1½—1*</td>
</tr>
<tr>
<td><strong>Thermodynamics</strong></td>
<td>5.73</td>
<td>1 — 1½—1*</td>
</tr>
<tr>
<td><strong>Electrical Engineering</strong></td>
<td>6.83</td>
<td>1 — 1½—1*</td>
</tr>
<tr>
<td><strong>Structures (Theory and Design)</strong></td>
<td>8.123</td>
<td>2 — 3</td>
</tr>
<tr>
<td><strong>Engineering Computations</strong></td>
<td>8.33</td>
<td>2 — 3*</td>
</tr>
<tr>
<td><strong>Philosophy</strong></td>
<td>G30</td>
<td>1 — 0</td>
</tr>
<tr>
<td><strong>Social Science Elective</strong></td>
<td></td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

| Total                          | 15 — 14 | 15 — 14 |

* Tutorial

Note.—A survey camp of one week's duration will be held in the third week of third term.
FOURTH YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.13</td>
<td>Mechanical Engineering Design</td>
<td>0 — 4½*</td>
<td>0 — 4½*</td>
<td></td>
</tr>
<tr>
<td>5.14</td>
<td>Mechanical Engineering Design</td>
<td>0 — 3*</td>
<td>0 — 6*</td>
<td></td>
</tr>
<tr>
<td>5.34</td>
<td>Theory of Machines</td>
<td>1 — 2*</td>
<td>1 — 2*</td>
<td></td>
</tr>
<tr>
<td>5.54</td>
<td>Fluid Mechanics</td>
<td>1 — 1½-1½*</td>
<td>1 — 1½-1½*</td>
<td></td>
</tr>
<tr>
<td>5.74</td>
<td>Thermodynamics</td>
<td>1½ — 1½-1½*</td>
<td>1½ — 1½-1½*</td>
<td></td>
</tr>
<tr>
<td>6.84</td>
<td>Electrical Engineering</td>
<td>1 — 1</td>
<td>1 — 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Professional Elective I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Professional Elective II</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seminar</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>2 — 0</td>
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<tr>
<td></td>
<td>Thesis Work</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>0 — 26</td>
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<tr>
<td></td>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td></td>
</tr>
</tbody>
</table>

* Tutorial

Professional Elective Subjects.

The full range of Professional Elective subjects is as shown hereunder. Not all subjects are offered each year.

- Automatic Control Engineering.
- Electric Power Generation and Utilization.
- Internal Combustion Engines and Gas Turbines.
- Production Engineering Design.
- Refrigeration, Ventilation and Air Conditioning.
- Steam Engineering.
- Turbomachines.
- Nuclear Engineering.

COURSE VB—MECHANICAL ENGINEERING

Course VB has been designed for students employed in an appropriate position in industry. The work undertaken is equivalent to that covered in Course V, but Course VB extends over seven part-time years, satisfactory completion of which, together with the necessary occupational experience, qualifies for the degree of Bachelor of Engineering (Pass or Honours). At least three years of appropriate industrial experience is required and this should include at least six months in an engineering workshop and at least six months in a drawing office.
### First Year

**(34 weeks part-time course)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics</td>
<td>1½-1½</td>
<td>1½-1½</td>
<td>1½-1½</td>
</tr>
<tr>
<td>Chemistry</td>
<td>2-1</td>
<td>2-1</td>
<td>2-1</td>
</tr>
<tr>
<td>Engineering Drawing</td>
<td>0-3*</td>
<td>0-3*</td>
<td>0-3*</td>
</tr>
<tr>
<td>Descriptive Geometry</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>Mathematics, Part I</td>
<td>1-½*</td>
<td>1-½*</td>
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</table>

**Hours per week**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Drawing</td>
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<td>0-3*</td>
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<tr>
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<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
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<tr>
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<td>1-½*</td>
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**Tutorial**

† 1st Half Year—Descriptive Geometry. 2nd Half Year—Engineering Drawing.

### Second Year

**(34 weeks part-time course)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
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<th>Term 3</th>
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<tbody>
<tr>
<td>Materials Technology</td>
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<td>1-½</td>
<td>1-½</td>
<td>1-½</td>
</tr>
<tr>
<td>Theory of Structures</td>
<td>1-½*</td>
<td>1-½*</td>
<td>0-0</td>
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<tr>
<td>Surveying†</td>
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<td>1-0</td>
</tr>
<tr>
<td>Properties of Materials</td>
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<tr>
<td>Mathematics, Part II</td>
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<td>1-½*</td>
<td>1-½*</td>
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<td>English</td>
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**Hours per week**

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<tr>
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<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
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<td>1-2</td>
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<tr>
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<td>1-½</td>
<td>1-½</td>
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<tr>
<td>Theory of Structures</td>
<td>1-½*</td>
<td>1-½*</td>
<td>0-0</td>
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<td>Surveying†</td>
<td>0-0</td>
<td>0-0</td>
<td>1-2</td>
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<tr>
<td>Properties of Materials</td>
<td>0-0</td>
<td>0-0</td>
<td>1-2</td>
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<td>Mathematics, Part II</td>
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**Tutorial**

* Plus four six-hour periods on Saturdays for fieldwork

### Third Year

**(34 weeks part-time course)**

<table>
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<tr>
<th>Course</th>
<th>Term 1</th>
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<th>Term 3</th>
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<tbody>
<tr>
<td>Mechanical Engineering Design</td>
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<td>0-3*</td>
<td>0-3*</td>
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<td>1½-0</td>
<td>1½-0</td>
<td>1½-0</td>
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<tr>
<td>Engineering Mechanics</td>
<td>1-½*</td>
<td>1-½*</td>
<td>1-½*</td>
</tr>
<tr>
<td>Thermodynamics</td>
<td>1-1*</td>
<td>1-1*</td>
<td>0-2</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Mathematics, Part I</td>
<td>1-½*</td>
<td>1-½*</td>
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**Hours per week**

<table>
<thead>
<tr>
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<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Engineering Design</td>
<td>0-3*</td>
<td>0-3*</td>
<td>0-3*</td>
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<tr>
<td>Mechanical Technology</td>
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<tr>
<td>Engineering Mechanics</td>
<td>1-½*</td>
<td>1-½*</td>
<td>1-½*</td>
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<td>Thermodynamics</td>
<td>1-1*</td>
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<td>0-2</td>
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<tr>
<td>Electrical Engineering</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
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<tr>
<td>Mathematics, Part I</td>
<td>1-½*</td>
<td>1-½*</td>
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**Tutorial**

183
### FOURTH YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory of Machines</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
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<tr>
<td>Fluid Mechanics</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
<td>0 - 0</td>
</tr>
<tr>
<td>Thermodynamics</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
<td>0 - 2</td>
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<tr>
<td>Electrical Engineering</td>
<td>1 1/2- 1 1/2* 1 1/2- 1 1/2* 1 1/2- 1 1/2* 1 1/2- 1 1/2*</td>
<td></td>
<td></td>
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<tr>
<td>Structures (Theory and Design)</td>
<td>1 1/2- 1 1/2* 1 1/2- 1 1/2* 1 1/2- 1 1/2* 1 1/2- 1 1/2*</td>
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<td>History</td>
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Total: 6 - 6 6 - 6 5 - 6

* Tutorial

### FIFTH YEAR

(34 weeks part-time course)

<table>
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<tr>
<th>Course</th>
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<th>Term 3</th>
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<tr>
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<td>Fluid Mechanics</td>
<td>1 - 1 1/2* 1 - 1 1/2* 1 - 1 1/2*</td>
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<td></td>
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<tr>
<td>Thermodynamics</td>
<td>1 - 1 1/2* 1 - 1 1/2* 1 - 1 1/2*</td>
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<td></td>
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<td>Seminar</td>
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Total: 3 1/2 - 6 3 1/2 - 6 2 - 6

* Tutorial

### SIXTH YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
<td>Physics</td>
<td>1 1/2- 1 1/2 2 1/2- 1 1/2 2 1/2- 1 1/2</td>
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<td></td>
</tr>
<tr>
<td>Theory of Machines</td>
<td>1 - 1 1/2* 2 - 1 1/2* 2 - 1 1/2*</td>
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<td></td>
</tr>
<tr>
<td>Engineering Computations</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Mathematics, Part II</td>
<td>1 - 1 1/2* 1 - 1 1/2* 1 - 1 1/2*</td>
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<tr>
<td>Philosophy</td>
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<td>1 - 0</td>
<td>1 - 0</td>
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Total: 6 1/2 - 2 1/2 6 1/2 - 2 1/2 6 1/2 - 2 1/2

* Tutorial
### SEVENTH YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
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<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>1 — 2*</td>
<td>1 — 2</td>
<td>1 — 3*</td>
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<tr>
<td>Fluid Mechanics</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>† Professional Elective I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>0 — 0</td>
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<tr>
<td>† Professional Elective II</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>0 — 0</td>
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<tr>
<td>Thesis Work</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>0 — 3</td>
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<tr>
<td>Social Science Elective</td>
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<tr>
<td></td>
<td>5 — 6</td>
<td>4 — 6</td>
<td>2 — 3</td>
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</table>

* Tutorial
† As set out for fourth year of Course V—Mechanical Engineering

**Conversion Course VC** for diplomates in mechanical engineering of the N.S.W. Department of Technical Education has been discontinued. Holders of this diploma, if issued by the Sydney Technical College between 31st December, 1950, and 30th June, 1957, who wish to proceed to a degree in mechanical engineering will now be admitted to Course VB with advanced standing. They will be required to pass the following subjects,

10.12 Mathematics, Part I,
G10 English,
G20 History,

together with the sixth and seventh years of Course VB.

Students currently enrolled in the Mechanical Engineering Conversion Course will complete the syllabus for this course as set out in the 1958 Calendar.

### COURSE VB1—NAVAL ARCHITECTURE

**First Year**
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
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<td>1 1/4 — 1 1/4</td>
<td>1 1/4 — 1 1/4</td>
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<tr>
<td>2.111 Chemistry</td>
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<td>2 — 1</td>
<td>2 — 1</td>
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<tr>
<td>5.11d Engineering Drawing</td>
<td>† 0 — 3*</td>
<td>0 — 3*</td>
<td>0 — 3*</td>
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<tr>
<td>5.41d Descriptive Geometry</td>
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<td>8.11d Engineering Mechanics</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>10.11 Mathematics, Part I</td>
<td>1 1/4 — 1 1/4*</td>
<td>1 1/4 — 1 1/4*</td>
<td>1 1/4 — 1 1/4*</td>
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<td>6 — 6</td>
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* Tutorial
† 1st Half Year—Descriptive Geometry. 2nd Half Year—Engineering Drawing.
### Second Year

**34 weeks part-time course**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tr>
<td><em>Materials Technology</em></td>
<td>4.912D</td>
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<td>1 1/2</td>
<td>1 1/2</td>
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<td>Theory of Structures</td>
<td>8.112D</td>
<td>1 1/2</td>
<td>4*</td>
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<td>Surveying†</td>
<td>8.42A</td>
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<td>8.92D</td>
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<td>0 0</td>
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<td>10.11</td>
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<td>3*</td>
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<td>English</td>
<td>G10</td>
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* Tutorial. † Plus four six-hour periods on Saturdays for fieldwork.

### Third Year

**34 weeks part-time course**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
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<th>Term 3</th>
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<tbody>
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<td>Mechanical Engineering Design</td>
<td>5.13D</td>
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<td>Engineering Mechanics</td>
<td>5.32D</td>
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<td>1 1/2*</td>
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<td>Fluid Mechanics</td>
<td>5.52D</td>
<td>1 1/2*</td>
<td>1 1/2*</td>
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<td>Thermodynamics</td>
<td>5.72D</td>
<td>1 1</td>
<td>1 1</td>
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<tr>
<td>Naval Architecture I</td>
<td>5.91D</td>
<td>1 1/4*</td>
<td>1 1/4*</td>
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<tr>
<td>Mathematics, Part I</td>
<td>10.12</td>
<td>1 1/2*</td>
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* Tutorial

### Fourth Year

**34 weeks part-time course**

<table>
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<tr>
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<th>Term 1</th>
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<th>Term 3</th>
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<tr>
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<td>5.53D</td>
<td>1 1/2*</td>
<td>1 1/2*</td>
</tr>
<tr>
<td>Naval Architecture II</td>
<td>5.92D</td>
<td>2 2*</td>
<td>1 3*</td>
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<td>Structures (Theory and Design)</td>
<td>8.123D</td>
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* Tutorial
**Fifth Year**

*(34 weeks part-time course)*

<table>
<thead>
<tr>
<th>Hours per week</th>
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<th>Term 3</th>
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<td>loc. lab./tut.</td>
<td>loc. lab./tut.</td>
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<td>1.42d Physics</td>
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<td>2 ½—1 ½</td>
<td>2 ½—1 ½</td>
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<td>3—3*</td>
<td>3—3*</td>
<td>2—4*</td>
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<td>G30 Philosophy</td>
<td>2—0</td>
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<td>1—0</td>
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<td><strong>Total</strong></td>
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<td>6 ½—4 ½</td>
<td>5 ½—5 ½</td>
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* Tutorial

**Sixth Year**

*(34 weeks part-time course)*

<table>
<thead>
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<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>loc. lab./tut.</td>
<td>loc. lab./tut.</td>
<td>loc. lab./tut.</td>
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<tr>
<td>5.94d Naval Architecture IV</td>
<td>3 ½—4 ½*</td>
<td>3 ½—4 ½—3*</td>
<td>3 ½—4 ½*</td>
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<td>6.83d Electrical Engineering</td>
<td>1—1 ½*</td>
<td>1—1 ½*</td>
<td>1—1 ½*</td>
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<tr>
<td>10.12 Mathematics, Part II</td>
<td>1—½*</td>
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<td><strong>Total</strong></td>
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<td>5 ½—6 ½</td>
<td>5 ½—6 ½</td>
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* Tutorial

**Seventh Year**

*(34 weeks part-time course)*

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<th>Hours per week</th>
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<td>loc. lab./tut.</td>
<td>loc. lab./tut.</td>
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<td>5.95d Naval Architecture V</td>
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<td>3—5*</td>
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<td>8.33 Engineering Computations</td>
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<tr>
<td>Social Science Elective</td>
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<td>1—0</td>
</tr>
<tr>
<td>Thesis Work and Seminar</td>
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<td>0—2</td>
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<td><strong>Total</strong></td>
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<td>5—7</td>
<td>4—8</td>
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* Tutorial
SCHOOL OF ELECTRICAL ENGINEERING

In preparation for a career in any branch of electrical engineering the student must acquire a knowledge of the basic sciences of mathematics and physics. Students should realise that electrical engineering, perhaps more than most other branches of engineering, is closely linked with the pure sciences, and requires a scientific outlook and approach for a proper understanding of the problems in electrical engineering.

There are three main branches of electrical engineering, viz.—
(a) power apparatus and systems—concerned mainly with electrical machinery, power generation, transmission and power systems; (b) utilization and control—concerned with the utilization and control of electrical plant and applied electronics; (c) communications—concerned with radio and line communications, radar and other navigational aids, and television. In the early stages of the course, students will concentrate on acquiring a knowledge of the basic science subjects of mathematics, physics and chemistry but will have some introduction to engineering. However, advanced students are given an opportunity to specialise in their field of interest. They may elect, with the approval of the Professor, to study one of the three branches: (a) Power Apparatus and Systems, (b) Utilization and Control, or (c) Communications, but will be required to study a common subject of Electrical Engineering. This will cover the portions of electrical engineering such as measurements, electron physics, servomechanisms, electric circuit and field theory, and electronics, which are common to all three fields of study.

Each student is required to work on a project under the guidance of members of the lecturing staff. Generally, the project will involve the design and construction of experimental apparatus together with laboratory tests. Where possible the projects will be related to the research programme of the School and will be designed to develop the student's initiative. Each student will be required to deliver a seminar paper and to prepare a thesis based on the results of the project work.

Provision is made in the full-time course for students to undertake additional work in their third and fourth years towards the award of an Honours degree.

Five courses are provided leading to the degree of Bachelor of Engineering, viz.:

- Course VI, a four-year day course.
- Course VIb, a part-time course extending over seven years.
- Conversion Course VIc1 for Associates of Sydney Technical College in both Electrical and Radio Engineering.
Conversion Course VIc2 for Associates of Sydney Technical College in Electrical Engineering.
Conversion Course VIc3 for Associates of Sydney Technical College in Radio Engineering.

COURSE VI—ELECTRICAL ENGINEERING

Course VI is of four years' duration. The first three years of the course each require attendance at the University for twenty-four weeks. For the remainder of each of these years the student gains practical experience in industry. The fourth year requires full-time day attendance for thirty-four weeks.

FIRST YEAR

(24 weeks day course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.41 Physics</td>
<td>3 - 3</td>
<td>3 - 3</td>
</tr>
<tr>
<td>2.111 Chemistry</td>
<td>3 - 3</td>
<td>3 - 0</td>
</tr>
<tr>
<td>5.11 Engineering Drawing</td>
<td>0 - 3*</td>
<td>0 - 3*</td>
</tr>
<tr>
<td>5.21 Mechanical Technology</td>
<td>2 1/2 - 0</td>
<td>2 1/2 - 0</td>
</tr>
<tr>
<td>5.41 Descriptive Geometry</td>
<td>1 - 2 1/2*</td>
<td>1 - 2 1/2*</td>
</tr>
<tr>
<td>5.71 Engineering Mechanics</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
</tr>
<tr>
<td>10.11 Mathematics</td>
<td>4 - 2*</td>
<td>4 - 2*</td>
</tr>
<tr>
<td>G10 English</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
</tbody>
</table>

* Tutorial

SECOND YEAR

(24 weeks day course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.12A Physics</td>
<td>4 - 3</td>
<td>4 - 3</td>
</tr>
<tr>
<td>4.912 Materials Technology</td>
<td>1 1/2 - 2</td>
<td>1 1/2 - 2</td>
</tr>
<tr>
<td>5.72 Thermodynamics</td>
<td>1 - 1 - 1*</td>
<td>1 - 1 - 1*</td>
</tr>
<tr>
<td>6.12 Electric Circuit Theory</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>8.112 Theory of Structures</td>
<td>1 1/2 - 1*</td>
<td>1 1/2 - 1*</td>
</tr>
<tr>
<td>8.92 Properties of Materials</td>
<td>1 - 2</td>
<td>0 - 0</td>
</tr>
<tr>
<td>10.12 Mathematics</td>
<td>3 - 2*</td>
<td>3 - 2*</td>
</tr>
<tr>
<td>10.62 Applied Mathematics</td>
<td>2 - 1*</td>
<td>2 - 1*</td>
</tr>
<tr>
<td>G20 History</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
</tbody>
</table>

* Tutorial

180
### Third Year
(24 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.33A Theory of Machines</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>6.13 Electric Circuit Theory</td>
<td>3 — 3</td>
<td>3 — 3</td>
</tr>
<tr>
<td>6.23 Electric Power Engineering</td>
<td>3 — 3</td>
<td>3 — 3</td>
</tr>
<tr>
<td>6.303 Electronics</td>
<td>3 — 3</td>
<td>3 — 3</td>
</tr>
<tr>
<td>8.41 Surveying † (Equiv. time)</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>10.33 Mathematics</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>**5.52 Fluid Mechanics</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>**10.63 Statistics</td>
<td>1 — 1*</td>
<td>1 — 1*</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5½—12</td>
<td>5½—12</td>
</tr>
</tbody>
</table>

* Tutorial
† A Survey Camp of one week's duration will be held in third week of third term
** Students may elect to take either Fluid Mechanics or Statistics

### Fourth Year
(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.104 Electrical Engineering</td>
<td>5 — 5</td>
<td>5 — 5</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

PLUS one of the following three options:—

**Option 1—Power Apparatus and Systems.**
- 6.214 Power Systems          | 4 — 3   | 4 — 3   |
- 6.224 Electrical Machines    | 4 — 3   | 4 — 3   |

**Option 2—Utilization and Control.**
- 6.234 Utilization and Control of Electrical Plant | 4 — 3   | 4 — 3   |
- 6.344 Applied Electronics    | 4 — 3   | 4 — 3   |

**Option 3—Communications.**
- 6.314 Radio Communications    | 8 — 6   | 8 — 6   |
- 6.334 Line Communications     |         |         |

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15 —11</td>
<td>15 —11</td>
</tr>
</tbody>
</table>

Students in doubt concerning the optional subjects in the third year and the options in the final year should consult the Professor of Electrical Engineering. It is expected that students specialising in Option 1—Power Apparatus and Systems—will elect to study 5.52 Fluid Mechanics. The subject 10.63 Statistics will be of most value to students intending to specialise in Communications or Control Systems.
**Third Term**

This term is mainly devoted to directed laboratory and research work on an approved subject, with special reading and study associated with the preparation of a thesis; seminar work is also carried out.

A course of specialist lectures, including engineering economics, is given by senior engineers from government departments and industry on problems met in practice. These are designed to acquaint the student with current projects and practical problems in industry and essential electrical services.

**NOTE.**—An opportunity is given to final year students to attend practical wiring classes towards qualifying for an Electrician's Licence.

**ADDITIONAL FOR HONOURS**

A full-time Honours course in electrical engineering is offered involving additional work in third and fourth years. Candidates for Honours must obtain the permission of the Head of the School to enter the course.

After satisfactorily completing the first and second years as set out above, candidates for Honours will undertake the following programme in third and fourth years.

**THIRD YEAR**

(24 weeks day course)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.33a</td>
<td>Theory of Machines</td>
<td>1 - 1</td>
</tr>
<tr>
<td>6.113</td>
<td>Engineering Principles (Honours)</td>
<td>2 - 0</td>
</tr>
<tr>
<td>6.13</td>
<td>Electric Circuit Theory</td>
<td>9 - 7</td>
</tr>
<tr>
<td>6.23</td>
<td>Electric Power Engineering</td>
<td>9 - 7</td>
</tr>
<tr>
<td>6.303</td>
<td>Electronics</td>
<td></td>
</tr>
<tr>
<td>8.41</td>
<td>Surveying † (Equivalent time)</td>
<td>½ - 1</td>
</tr>
<tr>
<td>10.33</td>
<td>Mathematics</td>
<td>2 - 0</td>
</tr>
<tr>
<td><strong>5.52</strong></td>
<td>Fluid Mechanics</td>
<td>1 - 1</td>
</tr>
<tr>
<td><strong>10.63</strong></td>
<td>Statistics</td>
<td>1 - 1*</td>
</tr>
<tr>
<td>G30</td>
<td>Philosophy</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td></td>
<td>2 - 0</td>
</tr>
</tbody>
</table>

**Tutorial**

† A Survey Camp of one week's duration will be held in third week of third term.

**Students may elect to take either Fluid Mechanics or Statistics.**

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FOURTH YEAR
(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Term 1</td>
</tr>
<tr>
<td></td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>6.114 Electrical Engineering (Honours)</td>
<td>3 — 0</td>
</tr>
<tr>
<td>6.104 Electrical Engineering</td>
<td>5 — 4</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Science)</td>
<td></td>
</tr>
</tbody>
</table>

PLUS one of the following three options:—

Option 1
- 6.214 Power Systems: 3 — 3 3 — 3
- 6.224 Electrical Machines: 3 — 3 3 — 3

Option 2
- 6.234 Utilization and Control of Electrical Plant: 3 — 3 3 — 3
- 6.344 Applied Electronics: 3 — 3 3 — 3

Option 3
- 6.314 Radio Communications: 6 — 6 6 — 6
- 6.334 Line Communications: 6 — 6 6 — 6

Third Term
Third term is devoted mainly to directed laboratory and research work on an approved subject, with special reading and study associated with the preparation of a thesis.

COURSE VIb—ELECTRICAL ENGINEERING
Course VIb has been designed for students employed in appropriate positions in industry. The work undertaken is equivalent to that covered in Course VI, but Course VIb extends over seven part-time years, satisfactory completion of which, together with the necessary occupational experience, qualifies for the degree of Bachelor of Engineering (Pass or Honours).

FIRST YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Term 1</td>
</tr>
<tr>
<td></td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.41D Physics</td>
<td>1$\frac{1}{2}$ — 1$\frac{1}{2}$</td>
</tr>
<tr>
<td>2.11I Chemistry</td>
<td>2 — 1</td>
</tr>
<tr>
<td>5.1ID Engineering Drawing</td>
<td>0 — 3*</td>
</tr>
<tr>
<td>5.41D Descriptive Geometry</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.11D Engineering Mechanics</td>
<td>1$\frac{1}{2}$ — 1$\frac{1}{2}$</td>
</tr>
<tr>
<td>10.1I Mathematics, Part I</td>
<td>6 — 6$\frac{1}{2}$</td>
</tr>
</tbody>
</table>

*Tutorial.
### SECOND YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.42D Physics</td>
<td>1½ – 1½</td>
<td>2½ – 1½</td>
<td>2½ – 1½</td>
</tr>
<tr>
<td>6.12D Electric Circuit Theory</td>
<td>1 – 2</td>
<td>1 – 2</td>
<td>1 – 2</td>
</tr>
<tr>
<td>8.112D Theory of Structures</td>
<td>1½ – ½</td>
<td>1½ – ½</td>
<td>0 – 0</td>
</tr>
<tr>
<td>8.92M Properties of Materials</td>
<td>0 – 0</td>
<td>0 – 0</td>
<td>1 – 1</td>
</tr>
<tr>
<td>10.11 Mathematics, Part II</td>
<td>1½ – ½*</td>
<td>1½ – ½*</td>
<td>1½ – ½*</td>
</tr>
<tr>
<td>G10 English</td>
<td>2 – 0</td>
<td>1 – 0</td>
<td>1 – 0</td>
</tr>
<tr>
<td>* Tutorial</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>7½ – 4½</td>
<td>7½ – 4½</td>
<td>7 – 5</td>
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</tbody>
</table>

### THIRD YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.43D Physics</td>
<td>1½ – 0</td>
<td>1½ – 0</td>
<td>0 – 1½</td>
</tr>
<tr>
<td>6.13A Electric Circuit Theory</td>
<td>1 – 1½</td>
<td>1 – 1½</td>
<td>1 – 1½</td>
</tr>
<tr>
<td>6.23A Electrical Engineering</td>
<td>1 – 2</td>
<td>1 – 2</td>
<td>1 – 2</td>
</tr>
<tr>
<td>6.303A Engineering</td>
<td>2 – 1*</td>
<td>2 – 1*</td>
<td>2 – 1*</td>
</tr>
<tr>
<td>10.12 Mathematics, Parts I and II</td>
<td>1½ – ½*</td>
<td>1½ – ½*</td>
<td>1½ – ½*</td>
</tr>
<tr>
<td>10.62D Applied Mathematics</td>
<td>2 – 0</td>
<td>2 – 0</td>
<td>0 – 0</td>
</tr>
<tr>
<td>G20 History</td>
<td>1 – 0</td>
<td>1 – 0</td>
<td>2 – 0</td>
</tr>
<tr>
<td>* Tutorial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 – 5</td>
<td>7 – 5</td>
<td>5½ – 6½</td>
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</table>

### FOURTH YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.13B Electric Circuit Theory</td>
<td>1 – 1*</td>
<td>1 – 1*</td>
<td>1 – 1*</td>
</tr>
<tr>
<td>6.303B Electronics</td>
<td>1 – 1½ – ½*</td>
<td>1 – 1½ – ½*</td>
<td>1 – 1½ – ½*</td>
</tr>
<tr>
<td>10.33 Mathematics</td>
<td>2 – 0</td>
<td>2 – 0</td>
<td>0 – 0</td>
</tr>
<tr>
<td>G20 History</td>
<td>1 – 0</td>
<td>1 – 0</td>
<td>2 – 0</td>
</tr>
<tr>
<td>* Tutorial</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 – 5</td>
<td>6 – 5</td>
<td>5 – 5</td>
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</tbody>
</table>
**Fifth Year**

*(34 weeks part-time course)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.912D Materials Technology</td>
<td>1½—2</td>
<td>1½—2</td>
<td>0—0</td>
</tr>
<tr>
<td>5.33A Theory of Machines</td>
<td>1—1</td>
<td>1—1</td>
<td>0—0</td>
</tr>
<tr>
<td>6.104D Electrical Engineering</td>
<td>4—3</td>
<td>4—3</td>
<td>4—3</td>
</tr>
<tr>
<td>8.42A Surveying†</td>
<td>0—0</td>
<td>0—0</td>
<td>1—0</td>
</tr>
</tbody>
</table>

| Total                                       | 6½—6   | 6½—6   | 5—3    |

† Plus four six-hour periods on Saturdays for field work

---

**Sixth Year**

*(34 weeks part-time course)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.72D Thermodynamics</td>
<td>1—1</td>
<td>1—1</td>
<td>1—1</td>
</tr>
<tr>
<td>5.52D Fluid Mechanics</td>
<td>1—1</td>
<td>1—1</td>
<td>0—0</td>
</tr>
<tr>
<td>10.63 Statistics</td>
<td>1—1</td>
<td>1—1</td>
<td>0—0</td>
</tr>
<tr>
<td>Electrical Engineering—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 1—Electrical Machines</td>
<td>2—4</td>
<td>2—4</td>
<td>2—4</td>
</tr>
<tr>
<td>Option 2—Utilization and Control of Electric Plant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 3—Communications I</td>
<td>2—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total                                       | 6—6    | 5—6    | 4—5    |

---

**Seventh Year**

*(34 weeks part-time course)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Engineering—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 1—Power Systems</td>
<td>2—3</td>
<td>2—3</td>
<td>2—3</td>
</tr>
<tr>
<td>Option 2—Applied Electronics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 3—Communications II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>0—4</td>
<td>0—4</td>
<td>0—4</td>
</tr>
<tr>
<td>Project/Thesis/Seminar</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total                                       | 4—7    | 3—7    | 3—7    |

---
CONVERSION COURSES—ELECTRICAL ENGINEERING

COURSE Vlc1—(For diplomates in both Electrical and Radio Engineering)

Diplomates in both Electrical and Radio Engineering who have completed the courses of study as set out in the 1954 Handbook of the N.S.W. Department of Technical Education are required to complete the following subjects in order to qualify for the degree of Bachelor of Engineering.

<table>
<thead>
<tr>
<th>Hours per week for 34 weeks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.43 D Physics ..........................</td>
</tr>
<tr>
<td>5.33 A Theory of Machines ..................</td>
</tr>
<tr>
<td>5.52 Fluid Mechanics* ..................</td>
</tr>
<tr>
<td>6.104 D Electrical Engineering ...............</td>
</tr>
<tr>
<td>8.42 A Surveying ..........................</td>
</tr>
<tr>
<td>10.33 Mathematics .......................</td>
</tr>
<tr>
<td>G13 English or G23 History or G33 Philosophy ..........</td>
</tr>
<tr>
<td>G43 Economics or G53 Government or G63 Psychology or G83 Sociology ....</td>
</tr>
<tr>
<td>Thesis ....................................</td>
</tr>
</tbody>
</table>

* 10.63 Statistics may be taken in lieu of 5.52 Fluid Mechanics

This work would normally be completed in two years, but could be spread over a longer period.

COURSE Vlc2—(For diplomates in Electrical Engineering)

Diplomates in Electrical Engineering who have completed the course of study as set out in the 1954 Handbook of the N.S.W. Department of Technical Education are required to complete the following additional work in order to qualify for the degree of Bachelor of Engineering.

<table>
<thead>
<tr>
<th>Hours per week for 34 weeks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.42 D Physics (if not already completed) .............</td>
</tr>
<tr>
<td>1.43 D Physics ..........................</td>
</tr>
<tr>
<td>5.33 A Theory of Machines ..................</td>
</tr>
<tr>
<td>5.52 Fluid Mechanics† ..................</td>
</tr>
<tr>
<td>6.104 D Electrical Engineering ...............</td>
</tr>
<tr>
<td>6.13 B Electric Circuit Theory ..................</td>
</tr>
<tr>
<td>8.42 A Surveying ..........................</td>
</tr>
<tr>
<td>*10.12 Mathematics, Part II ..................</td>
</tr>
<tr>
<td>10.33 Mathematics ..........................</td>
</tr>
<tr>
<td>G13 English or G23 History or G33 Philosophy ..........</td>
</tr>
<tr>
<td>G43 Economics or G53 Government or G63 Psychology or G83 Sociology ....</td>
</tr>
<tr>
<td>Thesis ....................................</td>
</tr>
</tbody>
</table>

* To be taken by diplomates of later than 1951 as a pre-requisite to 10.33 Mathematics.
† Diplomates of 1951 or earlier may be required to take 10.12 Mathematics, Parts I and II.

This work would normally be completed in three years, but could be spread over a longer period.
COURSE VIC3—(For diplomates in Radio Engineering)

Diplomates in Radio Engineering who have completed the course of study as set out in the 1954 Handbook of the N.S.W. Department of Technical Education are required to complete the following additional work for the degree of Bachelor of Engineering.

<table>
<thead>
<tr>
<th>Hours per week for 34 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.43D</strong> Physics ..................</td>
</tr>
<tr>
<td><strong>4.912</strong> Materials Technology ..........</td>
</tr>
<tr>
<td><strong>5.33A</strong> Theory of Machines ..........</td>
</tr>
<tr>
<td><strong>5.52</strong> Fluid Mechanics* ..........</td>
</tr>
<tr>
<td><strong>5.72</strong> Thermodynamics ..........</td>
</tr>
<tr>
<td><strong>6.104D</strong> Electrical Engineering ..........</td>
</tr>
<tr>
<td><strong>6.23B</strong> Electric Power Engineering ..........</td>
</tr>
<tr>
<td><strong>6.334D</strong> Line Communications ..........</td>
</tr>
<tr>
<td><strong>8.42A</strong> Surveying ..................</td>
</tr>
<tr>
<td><strong>10.33</strong> Mathematics ...............</td>
</tr>
<tr>
<td><strong>10.62</strong> Applied Mathematics † ..........</td>
</tr>
<tr>
<td><strong>G13</strong> English or G23 History or G33 Philosophy ..........</td>
</tr>
<tr>
<td><strong>G43</strong> Economics or G53 Government or G63 Psychology or G83 Sociology ..........</td>
</tr>
<tr>
<td>Thesis ................................</td>
</tr>
</tbody>
</table>

* 10.63 Statistics may be taken in lieu of 5.52 Fluid Mechanics.
† To be taken by students who have not completed 5.32D Engineering Mechanics or equivalent in Diploma course.

This work would normally be completed in three years, but could be spread over a longer period.

Graduate Courses in Automatic Control and Communications Engineering

The School of Electrical Engineering offers two graduate courses, one in Automatic Control and one in Communications Engineering, consisting of two years of evening study.

These courses may be taken as part of the requirements for the degree of Master of Engineering.

The course in Automatic Control was first introduced in 1956 and is designed to assist those who intend to specialize in feedback control systems.

The first year of the course in Communications Engineering is being introduced in 1959 to assist those making their careers in the field of communications.

Examinations will be held in each subject at the end of the year and each student will be required to undertake a project. In addition, candidates taking the course towards the degree of Master of Engineering will be required to submit a thesis which will be subject to examination according to the regulations governing the award of the degree. The entrance qualification will be a degree of Bachelor of Engineering of a recognised University and those wishing to proceed to the degree of Master of Engineering must comply with the entrance requirements for that degree as set out on page 122.
### COURSE VIG1—AUTOMATIC CONTROL

#### FIRST YEAR

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week</th>
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<tr>
<td>6.105</td>
<td>Advanced Mathematics</td>
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</tr>
<tr>
<td>6.305</td>
<td>Feedback Control Systems I</td>
<td>2 — 4</td>
</tr>
<tr>
<td>6.315</td>
<td>Computers</td>
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#### SECOND YEAR

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<th>Course Title</th>
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<tbody>
<tr>
<td>6.306</td>
<td>Feedback Control Systems II</td>
<td>2 — 4</td>
</tr>
<tr>
<td></td>
<td>Project/Thesis</td>
<td>0 — 4</td>
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### COURSE VIG2—COMMUNICATIONS ENGINEERING

#### FIRST YEAR

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<th>Course Title</th>
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<tr>
<td>6.105</td>
<td>Advanced Mathematics</td>
<td>2 — 0</td>
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<tr>
<td>6.325</td>
<td>Communications I</td>
<td>2 — 4</td>
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<td>6.335</td>
<td>Graduate Elective</td>
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#### SECOND YEAR

<table>
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<th>Course Title</th>
<th>Hours per week</th>
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</thead>
<tbody>
<tr>
<td>6.326</td>
<td>Communications II</td>
<td>2 — 4</td>
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<tr>
<td></td>
<td>Project/Thesis</td>
<td>0 — 4</td>
</tr>
</tbody>
</table>
SCHOOL OF MINING ENGINEERING AND APPLIED GEOLOGY

The School of Mining Engineering and Applied Geology offers courses in mining engineering and in applied geology leading to the degree of Bachelor of Engineering (Pass or Honours), and in fuel technology leading to the degree of Bachelor of Science (Pass or Honours). The courses provided are:

Course VII—Mining Engineering, a four-year day course.

Conversion Course VIIc—Mining Engineering, for Associates of Sydney Technical College or the Broken Hill School of Mines in Metalliferous Mining Engineering who desire to qualify for the degree of Bachelor of Engineering.

Course VIIa—Applied Geology, a four-year day course.

Course VIIa1—Fuel Technology, a four-year day course.

Course VIIb—Applied Geology, a part-time course extending over six years.

COURSE VII—MINING ENGINEERING

Technical developments in the mining industry are such as to demand increasing engineering proficiency from various grades of mining officials. These developments require that those who are being trained for the management of the industry shall receive firstly, a sound training in mechanical, electrical and some branches of civil engineering, and secondly, the application of these developments to the mining of coal and other minerals. A knowledge of the basic subjects, mathematics, physics, chemistry, etc., is also essential in order that such auxiliary subjects as coal cleaning, mineral dressing, gases and atmospheric conditions in mines, etc., may be properly understood. Hence, in the construction of the Mining Engineering course the object has been to produce mining engineers with a sound training in engineering subjects and well versed in the application of engineering principles in the mining industry.

In the first two years of the course, the subjects taught are the basic science subjects, together with the primary engineering subjects and an introduction to mining technology. Mining subjects proper are introduced in the second year, and are developed in the third and fourth years of the course, concurrently with the engineering subjects. Subjects which are important to mining engineers, such as surveying, mineral dressing and geology are given their proper place in the course.
The training in mining is aimed at giving students a thorough foundation in such subjects as mine ventilation, mine drainage, mine lighting, winding, haulage and transport, these subjects being common to practically all branches of mining work. The specialized application of these subjects to coal and metalliferous mining is treated in the final year of the course. Thus, although the course is designed to give students a sound training in mining, it also permits them to specialize in either coal or metalliferous mining.

Specialization is taken a stage further in the fourth year of the course by the provision of elective subjects for the preparation of theses. Preparatory work for the theses will commence during the practical training period following the third year of academic studies and will be continued by reading in the first and second terms of the fourth year. The third term in the fourth year will be taken up with further practical investigations and the preparation of theses.

The students in the Mining Engineering course are required to spend five months of each of the first three years in obtaining practical experience at mines, this training being based on a prepared programme designed to provide a comprehensive training in many aspects of mining work. This training is important in its relation to the academic training and to the Mines Department's requirements of practical training for candidates for Statutory Certificates of Competency.

**First Year**

(21 weeks day course )

<table>
<thead>
<tr>
<th>Course Code</th>
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<tr>
<td>1.41</td>
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<td></td>
<td></td>
<td>Term 2: 3 — 3</td>
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<td>2.111</td>
<td>Chemistry</td>
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<tr>
<td></td>
<td></td>
<td>Term 2: 3 — 0</td>
</tr>
<tr>
<td>5.11</td>
<td>Engineering Drawing</td>
<td>Term 1: 0 — 3*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Term 2: 0 — 3*</td>
</tr>
<tr>
<td>5.41</td>
<td>Descriptive Geometry</td>
<td>Term 1: 1 — 2½*</td>
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<tr>
<td></td>
<td></td>
<td>Term 2: 1 — 2½*</td>
</tr>
<tr>
<td>7.511</td>
<td>Introductory Geology and Mineralogy</td>
<td>Term 1: 1 — 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Term 2: 1 — 1</td>
</tr>
<tr>
<td>8.11</td>
<td>Engineering Mechanics</td>
<td>Term 1: 1 — 1*</td>
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<tr>
<td></td>
<td></td>
<td>Term 2: 1 — 1*</td>
</tr>
<tr>
<td>10.11</td>
<td>Mathematics</td>
<td>Term 1: 4 — 2*</td>
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<tr>
<td></td>
<td></td>
<td>Term 2: 4 — 2*</td>
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<tr>
<td>G10</td>
<td>English</td>
<td>Term 1: 2 — 0</td>
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<tr>
<td></td>
<td></td>
<td>Term 2: 2 — 0</td>
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</tbody>
</table>

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* Tutorial

**Note** — A survey camp of one week's duration will be conducted in the third week of third term.
**SECOND YEAR**

(24 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
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<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td>1.42 Physics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.912 Materials Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.32 Engineering Mechanics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.72 Thermodynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.012 Mining I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.502 Geology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.112 Theory of Structures</td>
<td></td>
<td></td>
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<tr>
<td>8.92 Properties of Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 Mathematics</td>
<td></td>
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<tr>
<td>G20 History</td>
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<table>
<thead>
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<tbody>
<tr>
<td>Term 1</td>
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<td></td>
</tr>
<tr>
<td>Term 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.42 Physics</td>
<td>2 — 2½</td>
<td>2 — 2½</td>
</tr>
<tr>
<td>4.912 Materials Technology</td>
<td>1½ — 2</td>
<td>1½ — 2</td>
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<tr>
<td>5.32 Engineering Mechanics</td>
<td>1½ — 1*</td>
<td>1½ — 1*</td>
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<tr>
<td>5.72 Thermodynamics</td>
<td>1 — 1—1*</td>
<td>1 — 1—1*</td>
</tr>
<tr>
<td>7.012 Mining I</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>7.502 Geology</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>8.112 Theory of Structures</td>
<td>1½ — 1*</td>
<td>1½ — 1*</td>
</tr>
<tr>
<td>8.92 Properties of Materials</td>
<td>3 — 2*</td>
<td>3 — 2*</td>
</tr>
<tr>
<td>10.12 Mathematics</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G20 History</td>
<td></td>
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<table>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Term 2</td>
<td></td>
<td></td>
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<tr>
<td>1.42 Physics</td>
<td>15½ —12½</td>
<td>16½ —14½</td>
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* Tutorial

**Note**—Field excursions will be arranged on several Saturdays in connection with the instruction in Geology.

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**THIRD YEAR**

(24 weeks day course)

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<tr>
<th>Course</th>
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<tr>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<td>5.52 Fluid Mechanics</td>
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<td>6.83 Electrical Engineering</td>
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<tr>
<td>7.013 Mining II</td>
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<tr>
<td>7.022 Mining Engineering I</td>
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<td></td>
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<tr>
<td>7.633 Geology</td>
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<tr>
<td>8.122 Structures</td>
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<td>8.43 Surveying</td>
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<td>Social Science Elective</td>
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<table>
<thead>
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<th>Hours per week</th>
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</thead>
<tbody>
<tr>
<td>Term 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.52 Fluid Mechanics</td>
<td>1 — 1*</td>
<td>1 — 1*</td>
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<tr>
<td>6.83 Electrical Engineering</td>
<td>2 — 3</td>
<td>2 — 3</td>
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<td>7.013 Mining II</td>
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<td>4 — 1</td>
</tr>
<tr>
<td>7.022 Mining Engineering I</td>
<td>3 — 0</td>
<td>3 — 0</td>
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<tr>
<td>7.633 Geology</td>
<td>2 — 3</td>
<td>2 — 3</td>
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<tr>
<td>8.122 Structures</td>
<td>1 — 2</td>
<td>1 — 2</td>
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<tr>
<td>8.43 Surveying</td>
<td>1½ — 2</td>
<td>1 — 2</td>
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<tr>
<td>G30 Philosophy</td>
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<tr>
<td>Social Science Elective</td>
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<td>2 — 0</td>
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<table>
<thead>
<tr>
<th>Hours per week</th>
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<tbody>
<tr>
<td>Term 1</td>
<td></td>
<td></td>
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<tr>
<td>Term 2</td>
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<tr>
<td>5.52 Fluid Mechanics</td>
<td>18½ —12</td>
<td>18—12</td>
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</table>

* Tutorial

**Note**—A survey camp of one week’s duration will be conducted in the third week of third term and will be followed by a Geology excursion also of one week’s duration.

At the completion of this stage of their course, the students have the option of attending practical training at either a coal or a metalliferous mine.
FOURTH YEAR
(34 weeks day course.)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
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<tbody>
<tr>
<td>7.014</td>
<td>Mining III</td>
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<td>7.023</td>
<td>Mining Engineering II</td>
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<td>7.034</td>
<td>Mineral Dressing</td>
<td>0 - 3</td>
<td>0 - 3</td>
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<td>7.534</td>
<td>Mining Geology</td>
<td>1 - 2</td>
<td>1 - 2</td>
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<td>Surveying</td>
<td>0 - 0</td>
<td>0 - 0</td>
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<td>8.45</td>
<td>Mine Surveying*</td>
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<td></td>
<td>Advanced Elective (Humanities or Social Science)</td>
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<td>First Aid</td>
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<td><strong>16 -10</strong></td>
<td><strong>17 -10</strong></td>
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</table>

* 2 hours lectures per week in 3rd Term.

Seminars will be arranged during the course of the year.

NOTE—A survey camp of one week's duration will be conducted in the third week of third term. Practical work connected with Astronomy and Geodesy will be conducted on several evenings during the course. A Geology excursion of one week's duration will be conducted during the third term.

Third Term

During the third term of the fourth year, students will devote time to the professional elective subjects and the preparation of their thesis.

COURSE VIIA—APPLIED GEOLOGY

The development of natural resources and the allied engineering activities make essential a type of training for geologists which embraces basic geological instruction and various features of its application in practice. The structure and syllabus of this course is designed so as to enable the graduates to enter immediately upon various aspects of applied geology and to play an effective part in associated engineering and technological practice.

In the early part of the course students receive instruction in the allied fundamental sciences and basic engineering subjects as well as introductory geology. Later geological instruction is developed and emphasis is placed progressively on engineering application and on economic aspects of geology.

The applied nature of the course is indicated by the inclusion of descriptive geometry, drawing and design, strength of materials, civil and mining engineering practice, soil mechanics, etc. Detailed treatment is given to various aspects of applied geology—engineering geology, mining geology, photogeology and geochemistry. Surveying and geophysics are also included.
Attendance at the University for students taking this full-time course is for two terms during the first three years and for three terms during the fourth year. All students will be required to complete satisfactorily a course of approved practical training during vacations.

**First Year**
*(24 weeks day course)*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
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<tbody>
<tr>
<td>1.41</td>
<td>Physics</td>
<td>3</td>
<td>3</td>
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<tr>
<td>2.111</td>
<td>Chemistry</td>
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<td>5.11</td>
<td>Engineering Drawing</td>
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<td>5.41</td>
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<td>8.11</td>
<td>Engineering Mechanics</td>
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* Tutorial

**Second Year**
*(24 weeks day course)*

<table>
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<td>Physics</td>
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<tr>
<td>2.32a</td>
<td>Physical Chemistry</td>
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<td>7.012</td>
<td>Mining I</td>
<td>2</td>
<td>2</td>
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<tr>
<td>7.054</td>
<td>Assaying</td>
<td>1</td>
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<tr>
<td>7.502</td>
<td>Geology</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7.512</td>
<td>Mineralogy and Crystallography</td>
<td>3</td>
<td>3</td>
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<tr>
<td>10.12</td>
<td>Mathematics</td>
<td>2</td>
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<td>G20</td>
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* Tutorial

**Third Year**
*(24 weeks day course)*

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<th>Course Title</th>
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<td>Petrology</td>
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<tr>
<td>7.513</td>
<td>Advanced Mineralogy</td>
<td>2</td>
<td>2</td>
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<tr>
<td>7.523</td>
<td>Stratigraphy and Palaeontology</td>
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<td>7.533</td>
<td>Economic Geology</td>
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<td>7.543</td>
<td>Geophysics</td>
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<td>7.553</td>
<td>Geology of Fuels</td>
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<td>Surveying</td>
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<td>8.63a</td>
<td>Engineering Construction</td>
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<td>8.73h</td>
<td>Soil Mechanics and Hydrology</td>
<td>2</td>
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<td>Philosophy</td>
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<td>Social Science Elective</td>
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<td>10.1</td>
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</table>
Field Instruction—

(i) One week of general surveying, taken with the Mining and Civil Engineering III students.

(ii) One week of geological field study.

(iii) Week-end field work on geophysical surveying.

Fourth Year
(34 weeks day course)

<table>
<thead>
<tr>
<th>Term</th>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td>1</td>
<td>7.014A Mining III</td>
<td>2 — 0</td>
<td>2 — 0</td>
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<tr>
<td></td>
<td>7.034 Mineral Dressing</td>
<td>2 — 3</td>
<td>2 — 3</td>
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<td></td>
<td>7.504 Advanced Petrology</td>
<td>2 — 2</td>
<td>0 — 0</td>
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<tr>
<td></td>
<td>7.534 Mining Geology</td>
<td>1 — 2</td>
<td>1 — 2</td>
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<tr>
<td></td>
<td>7.564 Photogrammetry and Photogeology</td>
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<td></td>
<td>7.574 Engineering Geology</td>
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<td>0 — 0</td>
</tr>
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<td></td>
<td>7.584 Structural Geology</td>
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<td></td>
<td>7.644 Geophysics and Geotectonics</td>
<td>2 — 0</td>
<td>0 — 0</td>
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<td>8</td>
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<td>1 — 0</td>
<td>0 — 0</td>
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<td></td>
<td>Elective Subjects</td>
<td>0</td>
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<tr>
<td></td>
<td>Advanced Elective (Humanities or Social Science)</td>
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<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26</td>
<td>22</td>
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</tbody>
</table>

Third Term: Mainly devoted to advanced study in Professional Elective subjects and to the preparation of a thesis.

Seminars: To be arranged during the course of the year.

Field Work: Excursions to mining centres, dam sites, etc.

Professional Elective Subjects: The formal lectures and laboratory hours included in the fourth year will be supplemented by a study of some selected phase of the course to an advanced stage, and the preparation of a thesis.

Elective subjects include:

1. Structural Geology.
2. Mining and Economic Geology.
3. Engineering Geology.
COURSE VIIa1—FUEL TECHNOLOGY

The course in fuel technology, leading to the degree of Bachelor of Science (Pass or Honours), was established to meet an important and growing need of Australian industry and research establishments. The subject is also of vital interest for the efficient utilization of our national fuel resources.

The course extends over four years and students study full-time during the day. The first year of the full-time course is identical with that of Applied Chemistry, Metallurgy, Chemical Engineering, Food Technology and Textile Technology. The fourth year of the course commences at the beginning of the second term, so as to provide a six-month period between the third and fourth year in which students obtain appropriate industrial experience. The degree of Bachelor of Science (Pass or Honours) is awarded depending on the degree of success of the student during the course.

One constant problem of the fuel industries is the improvement and developing of methods of processing and using solid, liquid and gaseous fuels to meet the continuously shifting patterns of demand. It is in this field of activity that the university-trained fuel technologist has a most important part to play.

The undergraduate course is planned to give prominence to the importance of scientific principles and the bearing of their application in practice. The training in the first two years consists essentially of instruction and laboratory experience in the basic sciences—chemistry, physics and mathematics—together with geology, general engineering, metallurgy and an introduction to fuel technology.

In the third year the emphasis shifts to the engineering subjects and in addition the course covers unit processes, mineral dressing and coal preparation, refractories and insulating materials, constitution, properties, processing and utilization of fuels, and the application of statistical methods.

The final year is devoted entirely to fuels and covers the geology and occurrence of fuels, stoichiometry, progress and developments in fuel science, and fuel plant technology. The latter includes the design, construction, testing and operation of boilers and furnaces, instrumentation and automatic control.

Industrial training is an integral part of the course and the student is required to spend a minimum of six months in industry gaining practical experience in some field of fuel technology and to submit a report on these activities. He will also attend seminars and discussion groups, visit works and undertake an individual research project in his final year.
**First Year**

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
<td>1.11</td>
<td>Physics</td>
<td>3 — 3</td>
<td>3 — 3</td>
<td>3 — 3</td>
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<tr>
<td>2.41</td>
<td>General Chemistry</td>
<td>3 — 6</td>
<td>3 — 6</td>
<td>3 — 6</td>
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<tr>
<td>5.101</td>
<td>Engineering Drawing and Materials</td>
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<td>1 — 3</td>
<td>0 — 0</td>
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<td>5.211</td>
<td>Workshop Processes and Practice</td>
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<tr>
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<td>4 — 2</td>
<td>0 — 0</td>
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<td>10.11n</td>
<td>Mathematics</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>2 — 2</td>
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<tr>
<td>G10</td>
<td>English</td>
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<tr>
<td>G20</td>
<td>History</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>2 — 0</td>
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</tbody>
</table>

**Total Hours**

15 —11
14 —14
10 —14

---

**Second Year**

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.92</td>
<td>Physics</td>
<td>$1\frac{1}{2}$ — 0</td>
<td>$1\frac{1}{2}$ — $1\frac{1}{2}$</td>
<td>$1\frac{1}{2}$ — $1\frac{1}{2}$</td>
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<tr>
<td>2.32</td>
<td>Physical Chemistry</td>
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<td>1 — 2½</td>
<td>1 — 0</td>
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<tr>
<td>2.33</td>
<td>Physical Chemistry</td>
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<td>1 — 3</td>
<td>1 — 3</td>
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<tr>
<td>2.42</td>
<td>Inorganic Chemistry</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 2½</td>
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<tr>
<td>2.52A</td>
<td>Quantitative Analysis</td>
<td>1 — 3</td>
<td>1 — 2</td>
<td>1 — 0</td>
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<tr>
<td>2.62</td>
<td>Organic Chemistry</td>
<td>1 — 2½</td>
<td>1 — 0</td>
<td>1 — 0</td>
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<tr>
<td>2.63</td>
<td>Organic Chemistry</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 3</td>
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<tr>
<td>4.12</td>
<td>General Metallurgy</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>7.511A</td>
<td>Introductory Geology and Mineralogy</td>
<td>1 — 1</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>7.912</td>
<td>Fuels I</td>
<td>2 — 0</td>
<td>1 — 2</td>
<td>1 — 4</td>
</tr>
<tr>
<td>8.92</td>
<td>Properties of Materials</td>
<td>1 — 1</td>
<td>1 — 1</td>
<td>1 — 2</td>
</tr>
<tr>
<td>8.132</td>
<td>Theory of Structures</td>
<td>1 — 1</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>10.22</td>
<td>Mathematics</td>
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</table>

**Total Hours**

13½—11½
14½—14
13½—16

---

205
### Third Year
(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering Operations</td>
<td>3 - 3</td>
<td>3 - 3</td>
<td>3 - 3</td>
</tr>
<tr>
<td>Engineering Design</td>
<td>0 - 3</td>
<td>0 - 3</td>
<td>0 - 0</td>
</tr>
<tr>
<td>Thermodynamics</td>
<td>1 - 1</td>
<td>1 - 1</td>
<td>0 - 2</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Mineral Dressing</td>
<td>2 - 3</td>
<td>2 - 3</td>
<td>0 - 0</td>
</tr>
<tr>
<td>Fuels II</td>
<td>2 - 2</td>
<td>2 - 3</td>
<td>4 - 6</td>
</tr>
<tr>
<td>Statistics I</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>0 - 0</td>
</tr>
</tbody>
</table>

**Total Hours per week:**
- Term 1: 12 - 14
- Term 2: 12 - 15
- Term 3: 9 - 13

### Fourth Year
(22 weeks day course)

Second and third terms only; long vacation and first term in industry.

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geology of Fuels</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>Fuels III</td>
<td>3 - 4\frac{1}{2}</td>
<td>2 - 4\frac{1}{2}</td>
</tr>
<tr>
<td>Fuel Plant Technology I</td>
<td>3 - 3</td>
<td>3 - 3</td>
</tr>
<tr>
<td>Fuel Project</td>
<td>0 - 6</td>
<td>0 - 9</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
</tbody>
</table>

**Total Hours per week:**
- Term 2: 9 - 14\frac{1}{2}
- Term 3: 8 - 17\frac{1}{2}
COURSE VIIb—APPLIED GEOLOGY

Course VIIb has been designed for students already employed in an appropriate position in industry or otherwise engaged on work allied to the subject matter of the course. The work undertaken is equivalent to that covered in Course VIIa, but Course VIIb extends over six part-time years, satisfactory completion of which, together with the necessary occupational experience, qualifies for the degree of Bachelor of Engineering.

FIRST YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.41D Physics</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>2.111 Chemistry</td>
<td>2—1</td>
<td>2—1</td>
<td>2—1</td>
</tr>
<tr>
<td>5.11D Engineeriing Drawing†</td>
<td>0—3*</td>
<td>0—3*</td>
<td>0—3*</td>
</tr>
<tr>
<td>5.41D Descriptive Geometry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.11D Engineering Mechanics</td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>10.11 Mathematics, Part I</td>
<td>1½—⅓</td>
<td>1⅔—⅓</td>
<td>1⅓—⅓</td>
</tr>
<tr>
<td></td>
<td>6—6½</td>
<td>6—6⅔</td>
<td>6—6⅔</td>
</tr>
</tbody>
</table>

† 5.41D, 1st half-year; 5.11D, 2nd half-year
* Tutorial

SECOND YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>2.32A Physical Chemistry</td>
<td>1—2½</td>
<td>1—2½</td>
<td>0—0</td>
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<tr>
<td>7.054d Assaying</td>
<td>0—0</td>
<td>0—0</td>
<td>0—5</td>
</tr>
<tr>
<td>7.62 Geology</td>
<td>2—1⅔</td>
<td>2—1⅔</td>
<td>2—1⅔</td>
</tr>
<tr>
<td>10.11 Mathematics, Part II</td>
<td>1⅓—⅓*</td>
<td>1⅓—⅓*</td>
<td>1⅓—⅓*</td>
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<tr>
<td>G10 English</td>
<td>2—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td></td>
<td>6⅔—4½</td>
<td>5⅔—4½</td>
<td>4½—6⅔</td>
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</table>

* Tutorial

Note—Six geological excursions will be held on Saturdays during first and second terms.
### Third Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
<td>1.420 Physics</td>
<td>1 1/4</td>
<td>2 1/4</td>
<td>2 1/4</td>
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<tr>
<td>7.503A Petrology</td>
<td>1</td>
<td>1 1/2</td>
<td>0</td>
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<tr>
<td>7.512 Mineralogy and Crystallography</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>7.523A Stratigraphy and Palaeontology</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8.430 Surveying</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>10.12 Mathematics, Part I</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* Tutorial

Note—Seven Saturdays (a total of 42 hours) will be devoted to surveying. Alternatively, the Survey Camp of one week’s duration held in third term may by attended.

A Geology excursion of five days’ duration will be held during third year.

### Fourth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.012 Mining I</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>7.503A Petrology</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>7.513 Advanced Mineralogy</td>
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<td>7.523A Stratigraphy and Palaeontology</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>7.533A Economic Geology</td>
<td>0</td>
<td>0</td>
<td>1</td>
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<tr>
<td>7.553 Geology of Fuels</td>
<td>1</td>
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<td>1</td>
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<td>10.12 Mathematics, Part II</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td>G20 History</td>
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* Tutorial

Note—A Geology excursion of five day’s duration will be held during fourth year.

### Fifth Year

(34 weeks part-time course)

<table>
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<tr>
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<th>Term 1</th>
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<tr>
<td>7.034 Mineral Dressing</td>
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<td>1</td>
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<tr>
<td>7.504 Advanced Petrology</td>
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<td>0</td>
<td>2</td>
</tr>
<tr>
<td>7.533B Economic Geology</td>
<td>1</td>
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<td>1</td>
</tr>
<tr>
<td>7.543 Geophysics</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>7.564 Photogrammetry and Photogeology</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8.63A Engineering Construction</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<tr>
<td>8.73H Soil Mechanics</td>
<td>1</td>
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<tr>
<td>G30 Philosophy</td>
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### SIXTH YEAR

(34 weeks part-time course)

<table>
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<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td>7.014A</td>
<td>Mining III</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>2 — 0</td>
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<tr>
<td>7.531</td>
<td>Mining Geology</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>0 — 0</td>
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<tr>
<td>7.574</td>
<td>Engineering Geology</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
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<tr>
<td>7.584</td>
<td>Structural Geology</td>
<td>1 — 2</td>
<td>0 — 0</td>
<td>0 — 0</td>
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<tr>
<td>7.644</td>
<td>Geophysics and Geotectonics</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.66B</td>
<td>Engineering Administration</td>
<td>1 — 0</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td></td>
<td>Social Science Elective†</td>
<td>2 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
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<tr>
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<td>Electives and Thesis†</td>
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<td>8</td>
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<td></td>
<td>12</td>
<td>10</td>
<td>11</td>
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</tbody>
</table>

† For details see page 203.

### CONVERSION COURSE VIIc—MINING ENGINEERING.

Holders of a diploma in Metalliferous Mining Engineering who have completed the course of study given at Broken Hill as set out in the 1958 Handbook of the New South Wales Department of Technical Education, and who desire to proceed to the degree of Bachelor of Engineering, are required to satisfactorily complete the following additional work:

*Diploma Mathematics II*, after which they will be permitted to enter a two-year full-time course under the Professor of Mining Engineering at Sydney.

This requires attendance in Sydney full-time from March to September in the first year, after which they will resume mining employment until the following March. The second year requires full-time attendance in Sydney from March to November.

The syllabus of work for the first year of this two-year course will consist of some of the normal degree course second year subjects and some of the third year subjects as follows:

**Hours per Week**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>1.42</td>
<td>Physics</td>
<td>4½</td>
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<tr>
<td></td>
<td>(Exemption may be granted if the student has completed Diploma Physics II.)</td>
<td></td>
</tr>
<tr>
<td>7.013</td>
<td>Mining II</td>
<td>5</td>
</tr>
<tr>
<td>7.022</td>
<td>Mining Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>8.122</td>
<td>Structures</td>
<td>3</td>
</tr>
<tr>
<td>10.12</td>
<td>Mathematics</td>
<td>5</td>
</tr>
<tr>
<td>G13</td>
<td>English or G23 History or G33 Philosophy</td>
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</tr>
<tr>
<td>G43</td>
<td>Economics or G53 Government or G63 Psychology or G83 Sociology</td>
<td>2</td>
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</tbody>
</table>

The second year syllabus will be the normal course set out for the fourth year of the degree course, less the Humanities subject.
SCHOOL OF CIVIL ENGINEERING

The School of Civil Engineering offers three courses in civil engineering leading to the degree of Bachelor of Engineering, and two courses in surveying leading to the degree of Bachelor of Surveying. Details of the courses in surveying are set out on pages 218 to 222 below.

The School also offers graduate courses in concrete structures, structural analysis, and in hydraulics and hydrology, leading to the award of the degree of Master of Technology. Details of these courses are set out on pages 223 to 225 below.

Civil engineering is broad in its scope, utilizing other specialised branches of engineering in planning, co-ordinating and constructing national works such as water supply and conservation projects, hydro-electric development, roads, railways, bridges, tunnels, large buildings, and irrigation, sewerage and harbour and river development. The civil engineer adapts the forces of nature for the use and convenience of mankind. His academic training must include a study of science and of engineering practice. He must combine this with experience and judgment and the knowledge and personality necessary to control large organisations of workers. This profession offers to a young man a considerable variety of types of work, ranging from specialised research and investigations, through routine design and construction work to higher positions which are often largely managerial and organisational in their nature.

The courses leading to the degree of Bachelor of Engineering (Pass or Honours) are:

Course VIII, requiring four years day attendance at the University, and including three periods of practical training in industry.*

Course VIIIb, requiring seven years' part-time attendance, together with at least three years of satisfactory experience in industry.

Course VIIIc, for Associates of Sydney Technical College in Civil Engineering. This course may be completed by three years' part-time study, or by one year's part-time and one year's full-time study.

The courses in civil engineering are arranged so that all students receive training in the basic principles of mathematics and science and in the fundamentals of engineering applications of such work

* Students who have completed the first two years of this course, together with Surveying, may apply to the University of Melbourne for admission to the new course in Agricultural Engineering with advanced standing.
to surveying, hydraulics, foundation engineering, structural design, and constructional work in the field. Ancillary subjects from other branches of engineering are also included, such as electrical engineering, mechanical engineering, engineering chemistry and the like. Satisfactory practical experience in industry, concurrent with academic training, is a feature of all courses, and detailed reports of such experience must be submitted by all degree students.

Provision is made in the final year for the student to carry out further work adapted to his special interests by electing to take two professional elective subjects.

The elective subjects are arranged so that a detailed study may be made into one or two important phases of civil engineering. The attention of the student may be directed to preliminary investigations necessary for large civil engineering projects, as considered in hydrology, photogrammetry or geology, or to the design aspects of civil engineering works, preceding the actual construction. Alternatively, a study of both the fundamental behaviour and practical aspects of materials may be undertaken, as in soil mechanics, concrete technology or hydraulics. The problems associated with the construction of projects may be studied in electives dealing with construction equipment and methods, management and highway engineering.

**COURSE VIII—CIVIL ENGINEERING**

**First Year**

(24 weeks day course)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.41</td>
<td>Physics</td>
<td>3 — 3</td>
</tr>
<tr>
<td>2.111</td>
<td>Chemistry</td>
<td>3 — 3</td>
</tr>
<tr>
<td>5.11</td>
<td>Engineering Drawing</td>
<td>0 — 3*</td>
</tr>
<tr>
<td>5.41</td>
<td>Descriptive Geometry</td>
<td>1 — 2⅔*</td>
</tr>
<tr>
<td>8.11</td>
<td>Engineering Mechanics</td>
<td>1 — 1*</td>
</tr>
<tr>
<td>10.11</td>
<td>Mathematics</td>
<td>4 — 2*</td>
</tr>
<tr>
<td>G10</td>
<td>English</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 — 14½</td>
</tr>
</tbody>
</table>

* Tutorial

Note.—A survey camp of one week’s duration must be attended in the third week of third term.

211
**SECOND YEAR**
(24 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td><strong>Term 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.42 Physics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.912 Materials Technology</td>
<td>1½ - 2</td>
<td>1½ - 2</td>
</tr>
<tr>
<td>5.52 Fluid Mechanics</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
</tr>
<tr>
<td>5.72 Thermodynamics</td>
<td>1 - 1½</td>
<td>1 - 1½</td>
</tr>
<tr>
<td>7.502 Geology</td>
<td>2 - 1</td>
<td>2 - 1</td>
</tr>
<tr>
<td>8.112 Theory of Structures</td>
<td>1½ - 1*</td>
<td>1½ - 1*</td>
</tr>
<tr>
<td>8.122 Structures</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>8.92 Properties of Materials †</td>
<td>1 - 2</td>
<td>0 - 0</td>
</tr>
<tr>
<td>10.12 Mathematics</td>
<td>3 - 2*</td>
<td>3 - 2*</td>
</tr>
<tr>
<td>G20 History</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16 - 15½</td>
<td>15 - 13½</td>
</tr>
</tbody>
</table>

* Tutorial
† This subject may alternatively be given in second term.

**NOTE**—Field excursions will be arranged on several Saturdays in connection with the instruction in Geology.

**THIRD YEAR**
(24 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td><strong>Term 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.12 Mechanical Engineering Design</td>
<td>0 - 3*</td>
<td>0 - 3*</td>
</tr>
<tr>
<td>6.83 Electrical Engineering</td>
<td>2 - 3</td>
<td>2 - 3</td>
</tr>
<tr>
<td>7.673 Engineering Geology</td>
<td>0 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>8.113 Structures</td>
<td>1½ - 2</td>
<td>1½ - 2</td>
</tr>
<tr>
<td>8.23 Materials of Construction</td>
<td>2 - 2</td>
<td>2 - 2</td>
</tr>
<tr>
<td>8.43 Surveying</td>
<td>1½ - 2</td>
<td>1½ - 2</td>
</tr>
<tr>
<td>8.53 Fluid Mechanics</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>8.63A Engineering Construction</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>8.63B Hydrology</td>
<td>1 - 0</td>
<td>½ - 0</td>
</tr>
<tr>
<td>8.73 Soil Mechanics</td>
<td>1 - 1½</td>
<td>1 - 1½</td>
</tr>
<tr>
<td>10.43 Statistics</td>
<td>2 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2 - 0</td>
<td>2 - 0</td>
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<tr>
<td><strong>Total</strong></td>
<td>17 - 14½</td>
<td>16½ - 14½</td>
</tr>
</tbody>
</table>

* Tutorial

**NOTE**—A survey camp of one week's duration must be attended in the third week of third term. A geology camp must be attended in the fourth week of third term.
FOURTH YEAR
(34 weeks day course)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.114</td>
<td>Structures</td>
<td>2—3</td>
<td>2—3</td>
</tr>
<tr>
<td>8.33</td>
<td>Engineering Computations</td>
<td>1½—0</td>
<td>1½—0</td>
</tr>
<tr>
<td>8.44</td>
<td>Surveying</td>
<td>2—2</td>
<td>2—2</td>
</tr>
<tr>
<td>8.54</td>
<td>Applied Hydraulics</td>
<td>1—1*</td>
<td>1—1*</td>
</tr>
<tr>
<td>8.64A</td>
<td>Public Health Engineering</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>8.64B</td>
<td>Road Engineering</td>
<td>1—0</td>
<td>1—0</td>
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<tr>
<td>8.65A</td>
<td>Railway Engineering</td>
<td>0—0</td>
<td>1—0</td>
</tr>
<tr>
<td>8.65B</td>
<td>Harbours and Rivers Engineering</td>
<td>1—0</td>
<td>0—0</td>
</tr>
<tr>
<td>8.65C</td>
<td>Irrigation Engineering</td>
<td>0—0</td>
<td>1—0</td>
</tr>
<tr>
<td>8.65D</td>
<td>Hydro-Electric Engineering</td>
<td>1—0</td>
<td>0—0</td>
</tr>
<tr>
<td>8.66A</td>
<td>Engineering Construction</td>
<td>2—0</td>
<td>0—0</td>
</tr>
<tr>
<td>8.66B</td>
<td>Engineering Administration</td>
<td>1—0</td>
<td>0—0</td>
</tr>
<tr>
<td>8.94</td>
<td>Properties of Materials</td>
<td>0—0</td>
<td>1—2</td>
</tr>
<tr>
<td>11.196</td>
<td>Town Planning</td>
<td>2—0</td>
<td>0—2</td>
</tr>
<tr>
<td>11.82A</td>
<td>Theory of Architecture</td>
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<td>0—0</td>
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</table>

Professional Elective A.
Professional Elective B.
Advanced Elective (Humanities or Social Science)

<table>
<thead>
<tr>
<th>Lab./tut.</th>
<th>Lab./tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20½—10</td>
<td>15½—14</td>
</tr>
</tbody>
</table>

Six hours per week for 3 terms consisting of 2 hours lecture and 4 hours laboratory, drawing office or tutorial.

* Tutorial.

NOTE—A survey camp of one week's duration must be attended in the third week of third term.

Third Term

The third term of fourth year is mainly devoted to directed laboratory and research work on Professional Elective Subjects, with special reading and study associated with the preparation of a thesis. Each student will also read a paper in a seminar session.
Professional Elective Subjects

Throughout fourth year each student is required to pursue work adapted to his special interest and abilities by electing to take two of the following electives, the choice being subject to the approval to the Head of the School. Students may be instructed to attend certain lectures given by learned societies and other educational authorities during the year.

- Theory and design of structures.
- Soil mechanics.
- Hydrology.
- Hydraulics.
- Construction equipment and methods.
- Geology.
- Management.
- Highway engineering.
- Surveying.
- Concrete technology.
- Experimental stress analysis.

COURSE VIII—CIVIL ENGINEERING

This course provides students who are suitably employed during the day with the opportunity of obtaining the degree of Bachelor of Engineering by seven years of evening study.

The total content of the course is the same as that of the day course except that slightly less formal class time is provided in certain subjects in which the student's study is supplemented by his practical experience in industry.

First Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours per week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>Term 1</td>
<td>Term 2</td>
<td>Term 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td>1 1/4</td>
<td>1 1/4</td>
</tr>
<tr>
<td>Chemistry</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Engineering Drawing</td>
<td>0 - 3*</td>
<td>0 - 3*</td>
</tr>
<tr>
<td>Descriptive Geometry</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Engineering Mechanics</td>
<td>1 1/4 - 1/2*</td>
<td>1 1/4 - 1/2*</td>
</tr>
<tr>
<td>Mathematics, Part I</td>
<td>6 - 6 1/2</td>
<td>6 - 6 1/2</td>
</tr>
</tbody>
</table>

* Tutorial

† First half year—Descriptive Geometry; Second half year—Engineering Drawing.
## Second Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.912d</td>
<td>Materials Technology</td>
<td>1½ - 2</td>
<td>1½ - 2</td>
<td>0 - 0</td>
</tr>
<tr>
<td>7.502</td>
<td>Geology</td>
<td>1 - 1</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>8.112d</td>
<td>Theory of Structures</td>
<td>1½ - ½*</td>
<td>1½ - ½*</td>
<td>0 - 0</td>
</tr>
<tr>
<td>10.11</td>
<td>Mathematics, Part II</td>
<td>1½ - ½*</td>
<td>1½ - ½*</td>
<td>½ - ½*</td>
</tr>
<tr>
<td>G10</td>
<td>English</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7½ - 4½</td>
<td>6½ - 4½</td>
<td>3½ - 1½</td>
</tr>
</tbody>
</table>

* Tutorial

Note—Field excursions will be arranged on several Saturdays in connection with instruction in Geology.

## Third Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.12d</td>
<td>Mechanical Engineering, Design</td>
<td>0 - 2</td>
<td>0 - 2</td>
<td>0 - 0</td>
</tr>
<tr>
<td>5.52b</td>
<td>Fluid Mechanics</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
<td>0 - 0</td>
</tr>
<tr>
<td>5.72d</td>
<td>Thermodynamics</td>
<td>1 - 1</td>
<td>1 - 1</td>
<td>0 - 2</td>
</tr>
<tr>
<td>8.122d</td>
<td>Structures</td>
<td>1 - 1</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>8.43d</td>
<td>Surveying</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>8.92d</td>
<td>Properties of Materials</td>
<td>0 - 0</td>
<td>0 - 0</td>
<td>1 - 2</td>
</tr>
<tr>
<td>10.12d</td>
<td>Mathematics, Part I</td>
<td>1 - ½*</td>
<td>1 - ½*</td>
<td>½ - ½*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 - 5½</td>
<td>5 - 5½</td>
<td>4 - 5½</td>
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</tbody>
</table>

* Tutorial

Note—Seven Saturdays (a total of 42 hours) will be devoted to Surveying field work.

## Fourth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.113d</td>
<td>Structures</td>
<td>1 - 1½</td>
<td>1 - 1½</td>
<td>1 - 1½</td>
</tr>
<tr>
<td>8.23d</td>
<td>Materials of Construction</td>
<td>1 - 1½</td>
<td>1 - 1½</td>
<td>1 - 1½</td>
</tr>
<tr>
<td>8.53d</td>
<td>Fluid Mechanics</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>0 - 1½</td>
</tr>
<tr>
<td>8.63A</td>
<td>Engineering Construction</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>8.73d</td>
<td>Soil Mechanics</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>0 - 3</td>
</tr>
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<td>10.43</td>
<td>Statistics</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
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<tr>
<td>G20</td>
<td>History</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>2 - 0</td>
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<td></td>
<td></td>
<td>8 - 3</td>
<td>7 - 3</td>
<td>4 - 7½</td>
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</table>
### Fifth Year

**34 weeks part-time course**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.83D Electrical Engineering</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>8.44D Surveying</td>
<td>1½</td>
<td>0</td>
<td>1½</td>
</tr>
<tr>
<td>8.63B Hydrology</td>
<td>1½</td>
<td>0</td>
<td>1½</td>
</tr>
<tr>
<td>8.64A Public Health Engineering</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8.64B Road Engineering</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8.65A Railway Engineering</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.65B Harbours and Rivers Engineering</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8.65C Irrigation Engineering</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.66D Hydro-Electric Engineering</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8.94 Properties of Materials</td>
<td>0</td>
<td>0</td>
<td>1</td>
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<tr>
<td>11.196 Town Planning</td>
<td>2</td>
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<tr>
<td>Seminar</td>
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<td>3</td>
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**Note:** Seven Saturdays (a total of 42 hours) will be devoted to Surveying field work. Students are also required to attend a survey camp of one week’s duration in third week of third term.

### Sixth Year

**34 weeks part-time course**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.42D Physics</td>
<td>1½</td>
<td>1½</td>
<td>2½</td>
</tr>
<tr>
<td>7.673 Engineering Geology†</td>
<td>2</td>
<td>1½</td>
<td>2</td>
</tr>
<tr>
<td>8.114 Structures</td>
<td>2</td>
<td>1½</td>
<td>2½</td>
</tr>
<tr>
<td>8.54A Applied Hydraulics</td>
<td>1½</td>
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<td>1½</td>
</tr>
<tr>
<td>10.12 Mathematics, Part II</td>
<td>1</td>
<td>1½*</td>
<td>1</td>
</tr>
<tr>
<td>11.82A Theory of Architecture</td>
<td>0</td>
<td>0</td>
<td>1½</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Tutorial**

† Plus 2 Saturday Geology excursions

### Seventh Year

**34 weeks part-time course**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.33 Engineering Computations</td>
<td>1</td>
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<td>1</td>
</tr>
<tr>
<td>8.66A Engineering Construction</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.66B Engineering Administration</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Professional Elective A</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Professional Elective B</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Thesis</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2</td>
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<td>1</td>
</tr>
</tbody>
</table>

**216**
CONVERSION COURSE VIIIc—CIVIL ENGINEERING

Holders of the diploma in Civil Engineering granted by the N.S.W. Department of Technical Education, who wish to proceed to the Degree of Bachelor of Engineering, may qualify upon satisfactory completion of the following conversion course.

**FIRST YEAR**

(34 weeks evening course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.42d Physics</td>
<td>1½ — 1½</td>
<td>2½ — 1½</td>
<td>2½ — 1½</td>
</tr>
<tr>
<td>† Conversion Theory of Structures</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Conversion Soil Mechanics</td>
<td>0 — 3</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Conversion Materials of Construction</td>
<td>0 — 0</td>
<td>0 — 2</td>
<td>0 — 2</td>
</tr>
<tr>
<td>10.12 Mathematics</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>2 — 1</td>
</tr>
<tr>
<td>G13 English or G23 History or G33 Philosophy</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td>6½ — 5½</td>
<td>7½ — 4½</td>
<td>7½ — 4½</td>
</tr>
</tbody>
</table>

† This subject need only be taken by students who took Materials and Structures in their Diploma course, students who completed Strength of Materials I and II being exempt. Students may also be exempted on the basis of their performance in the subject of Engineering Design, provided such subject was taken under the revised syllabus (1947 and subsequently).

**SECOND YEAR**

(34 weeks evening course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>8.33 Engineering Computations</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.54 Applied Hydraulics</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.63B Hydrology*</td>
<td>1½ — 0</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.64A Public Health Engineering*</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.64B Road Engineering*</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.65A Railway Engineering*</td>
<td>1 — 0</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.65B Harbours and Rivers Engineering*</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.65C Irrigation Engineering*</td>
<td>0 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.65D Hydro-Electric Engineering</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.66B Engineering Administration</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>10.43 Statistics</td>
<td>2 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>11.196 Town Planning*</td>
<td>2 — 0</td>
<td>0 — 2</td>
<td>0 — 0</td>
</tr>
<tr>
<td>G43 Economics or G53 Government or G63 Psychology or G83 Sociology</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
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<tr>
<td></td>
<td>12½ — 0</td>
<td>8 — 2</td>
<td>7 — 0</td>
</tr>
</tbody>
</table>

* Students may be exempted from corresponding subjects completed in the diploma course. In addition to the above, students may be required to attend certain lectures and carry out certain assignments in 8.44 Surveying and 8.114 Structures.
THIRD YEAR
(34 weeks evening course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>8.94 Properties of Materials</td>
<td>0 — 0</td>
<td>1 — 2</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Elective A</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
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<tr>
<td>Elective B</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Thesis</td>
<td>0 — 2</td>
<td>0 — 2</td>
<td>0 — 2</td>
</tr>
<tr>
<td></td>
<td>2 — 6</td>
<td>3 — 8</td>
<td>2 — 6</td>
</tr>
</tbody>
</table>

Note—Students who have completed the first year of the evening conversion course may attend for 34 weeks full-time in the following year and complete in one year of day study the work of the second and third years of the evening conversion course.

COURSE VIII—SURVEYING

The profession of surveying is closely related to civil engineering and is concerned with national mapping, delineation of property boundaries and engineering surveying, including the collection of all the necessary data which are essential before a civil engineering project can be designed.

Course VIII, the full-time course, requires four years' attendance at the University and includes a period of practical training in the field during the third term and long vacation of each of the first three years.

FIRST YEAR
(24 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.41 Physics</td>
<td>3 — 3</td>
<td>3 — 3</td>
</tr>
<tr>
<td>2.111 Chemistry</td>
<td>3 — 3</td>
<td>3 — 0</td>
</tr>
<tr>
<td>5.41 Descriptive Geometry</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>8.401 Plotting and Plan Drawing</td>
<td>0 — 3</td>
<td>0 — 3</td>
</tr>
<tr>
<td>8.411 Surveying</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>10.11 Mathematics</td>
<td>4 — 2</td>
<td>4 — 2</td>
</tr>
<tr>
<td>G10 English</td>
<td>2 — 0</td>
<td>2 — 0</td>
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<tr>
<td></td>
<td>14 —15</td>
<td>14 —12</td>
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</table>

Note—A survey camp of two weeks' duration must be attended in the third and fourth weeks of third term.
### SECOND YEAR

*(24 weeks day course)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
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<tbody>
<tr>
<td>lec.</td>
<td>lab./tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>Physics</td>
<td>1.42</td>
<td>2 — 2½</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td>5.52</td>
<td>1 — 1*</td>
</tr>
<tr>
<td>Geology</td>
<td>7.502</td>
<td>2 — 1</td>
</tr>
<tr>
<td>Surveying</td>
<td>8.412</td>
<td>2 — 2</td>
</tr>
<tr>
<td>Survey Computations</td>
<td>8.422</td>
<td>1 — 1½</td>
</tr>
<tr>
<td>Land Utilization</td>
<td>8.432</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Astronomy</td>
<td>8.442</td>
<td>2 — 3</td>
</tr>
<tr>
<td>Geodesy</td>
<td>8.452</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Mathematics</td>
<td>10.12</td>
<td>3 — 2*</td>
</tr>
<tr>
<td>History</td>
<td>G20</td>
<td>2 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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<td>17 — 13</td>
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</table>

* Tutorial

**Note**—A survey camp of two week’s duration must be attended during the third and fourth weeks of third term. Field excursions will be arranged on several Saturdays in connection with instruction in 7.502 Geology and 8.432 Land Utilization.

### THIRD YEAR

*(24 weeks day course)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec.</td>
<td>lab./tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>Physical Techniques IV (Optical Design)</td>
<td>1.23B</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Engineering Geology</td>
<td>7.673</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Surveying</td>
<td>8.413</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Survey Computations</td>
<td>8.423</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Astronomy</td>
<td>8.443</td>
<td>1½ — 1½</td>
</tr>
<tr>
<td>Photogrammetry</td>
<td>8.473</td>
<td>3 — 0</td>
</tr>
<tr>
<td>Engineering Construction</td>
<td>8.63A</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Hydrology</td>
<td>8.63B</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Hydrology</td>
<td>8.63C</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Soil Mechanics</td>
<td>8.73</td>
<td>1 — 1½</td>
</tr>
<tr>
<td>Statistics</td>
<td>10.43</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Mathematics</td>
<td>10.63</td>
<td>2 — 1½</td>
</tr>
<tr>
<td>Philosophy</td>
<td>G30</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td>18½ — 8½</td>
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</tbody>
</table>

**Note**—A survey camp of two weeks’ duration must be attended during the third and fourth weeks of third term. A geology camp of one week’s duration must also be attended.
### Fourth Year

(34 weeks day course)

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td>1.23d Physical Techniques (Instrument Design)</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>........</td>
</tr>
<tr>
<td>7.542 Geophysics</td>
<td>2 — 1</td>
<td>2 — 0</td>
<td>........</td>
</tr>
<tr>
<td>8.404 Map Compilation and Reproduction</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>........</td>
</tr>
<tr>
<td>8.453 Geodesy</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>........</td>
</tr>
<tr>
<td>8.454 Map Projections</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>........</td>
</tr>
<tr>
<td>8.474 Photogrammetry</td>
<td>2 — 0</td>
<td>1 — 0</td>
<td>........</td>
</tr>
<tr>
<td>8.484 Land Valuation</td>
<td>2 — 0</td>
<td>1 — 0</td>
<td>........</td>
</tr>
<tr>
<td>8.494 Survey Laws and Regulations</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>........</td>
</tr>
<tr>
<td>8.64a Road Engineering</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>........</td>
</tr>
<tr>
<td>8.65a Railway Engineering</td>
<td>0 — 0</td>
<td>1 — 0</td>
<td>........</td>
</tr>
<tr>
<td>8.65b Harbours and Rivers Engineering</td>
<td>0 — 0</td>
<td>1 — 0</td>
<td>........</td>
</tr>
<tr>
<td>8.65c Irrigation Engineering</td>
<td>0 — 0</td>
<td>1 — 0</td>
<td>........</td>
</tr>
<tr>
<td>8.66a Engineering Construction</td>
<td>2 — 0</td>
<td>0 — 0</td>
<td>........</td>
</tr>
<tr>
<td>11.196 Town Planning</td>
<td>2 — 0</td>
<td>0 — 2</td>
<td>........</td>
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</tbody>
</table>

**Advanced Elective (Humanities or Social Science)**

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>Thesis and Seminar</td>
<td>0 — 4</td>
<td>0 — 4</td>
<td>0 — 10</td>
</tr>
</tbody>
</table>

**Total Hours:**

- Term 1: 21 1/4
- Term 2: 8 1/4
- Term 3: 10

**Note:** A survey camp of two weeks' duration must be attended during the third and fourth weeks of third term. Field exercises in triangulation, astronomy and photogrammetry will be done at the camp. The third term will be mainly devoted to field work and laboratory work and special reading associated with the preparation of a thesis. Each student will also read a paper in a seminar session.

### Course VIIIb—Surveying

The part-time course is equivalent in content to the full-time course, and extends over seven part-time years. Students are required to have had three years of satisfactory experience in industry at the completion of their course.

### First Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.41d Physics</td>
<td>1 1/2 — 1 1/2</td>
<td>1 1/2 — 1 1/2</td>
<td>1 1/2 — 1 1/2</td>
</tr>
<tr>
<td>2.111 Chemistry</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>2 — 1</td>
</tr>
<tr>
<td>5.41d Descriptive Geometry</td>
<td>0 — 3</td>
<td>0 — 3</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.411d Surveying</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.422 Survey Computations</td>
<td>0 — 0</td>
<td>0 — 2</td>
<td>0 — 2 1/2</td>
</tr>
<tr>
<td>10.11 Mathematics, Part I</td>
<td>1 1/2 — 1 1/2</td>
<td>1 1/2 — 1 1/2</td>
<td>1 1/2 — 1 1/2</td>
</tr>
</tbody>
</table>

**Total Hours:**

- Term 1: 6 — 6 1/4
- Term 2: 6 — 5 1/2 — 6 1/4
- Term 3: 6 — 5 1/2

* Tutorial

**Note:** Seven Saturdays (a total of 42 hours) will be devoted to Surveying field work.

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### Second Year

**Lesson plan**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.42D Physics</td>
<td>1 1/4</td>
<td>2 1/4</td>
<td>2 1/4</td>
</tr>
<tr>
<td>7.502 Geology</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8.412D Surveying</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10.11 Mathematics, Part II</td>
<td>1 1/4</td>
<td>1 1/4</td>
<td>1 1/4</td>
</tr>
<tr>
<td>G10 English</td>
<td>2</td>
<td>1</td>
<td>1</td>
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</table>

**Hours per week**

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7-3</td>
<td>7-3</td>
<td>8-2</td>
</tr>
</tbody>
</table>

**Note**

- Eight Saturdays (a total of 48 hours) will be devoted to Surveying field work. Field excursions will be arranged on several Saturdays in connection with instruction in Land Utilization.
- A survey camp of two weeks duration must be attended in the third and fourth weeks of the third term.

### Third Year

**Lesson plan**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.52 Fluid Mechanics</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>8.401 Plotting and Plan Drawing</td>
<td>0 - 2 1/2</td>
<td>0 - 2 1/2</td>
<td>0 - 1 1/4</td>
</tr>
<tr>
<td>8.413D Surveying</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8.423D Survey Computations</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>8.432 Land Utilization</td>
<td>1 1/2</td>
<td>2 1/2</td>
<td>0</td>
</tr>
<tr>
<td>8.442 Astronomy</td>
<td>1</td>
<td>1 1/2</td>
<td>1 1/2</td>
</tr>
<tr>
<td>10.12 Mathematics, Part I</td>
<td>1 - 1/2</td>
<td>1 - 1/2</td>
<td>1 - 1/2</td>
</tr>
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</table>

**Hours per week**

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6 - 6</td>
<td>6 1/4</td>
<td>3 1/4</td>
</tr>
</tbody>
</table>

**Note**

- Eight Saturdays (a total of 48 hours) will be devoted to Surveying field work. Field excursions will be arranged on several Saturdays in connection with instruction in Geology.

### Fourth Year

**Lesson plan**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.23B Physical Techniques IV (Optical Design)</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1.23D Physical Techniques VI</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>8.63A Engineering Construction</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>8.73D Soil Mechanics</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>8.443 Astronomy</td>
<td>1 - 1/2</td>
<td>1 - 1/2</td>
<td>1 - 1/2</td>
</tr>
<tr>
<td>10.12 Mathematics, Part II</td>
<td>1 - 1/2</td>
<td>1 - 1/2</td>
<td>1 - 1/2</td>
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<tr>
<td>G20 History</td>
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</tr>
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**Hours per week**

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8 - 1 1/2</td>
<td>8 - 1 1/2</td>
<td>4 - 4 1/2</td>
</tr>
</tbody>
</table>

**Note**

- A survey camp of two weeks duration must be attended in the third and fourth weeks of the third term.
### Fifth Year

**34 weeks part-time course**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.452</td>
<td>Geodesy</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>8.473</td>
<td>Photogrammetry</td>
<td>3 - 0</td>
<td>1(\frac{1}{2}) - 1(\frac{1}{2})</td>
<td>0 - 3</td>
</tr>
<tr>
<td>8.484</td>
<td>Land Valuation</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>8.494</td>
<td>Survey Laws and Regulations</td>
<td>1(\frac{1}{2}) - 0</td>
<td>1(\frac{1}{2}) - 0</td>
<td>1(\frac{1}{2}) - 0</td>
</tr>
<tr>
<td>8.63B</td>
<td>Hydrology</td>
<td>0 - 0</td>
<td>1(\frac{1}{2}) - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>8.63C</td>
<td>Hydrology</td>
<td>0 - 0</td>
<td>0 - 0</td>
<td>1(\frac{1}{2}) - 0</td>
</tr>
<tr>
<td>8.64B</td>
<td>Road Engineering</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>8.65A</td>
<td>Railway Engineering</td>
<td>0 - 0</td>
<td>0 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>10.43</td>
<td>Statistics</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>11.196</td>
<td>Town Planning</td>
<td>2 - 0</td>
<td>0 - 2</td>
<td>0 - 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11(\frac{1}{2})</strong></td>
<td><strong>8(\frac{1}{2})</strong></td>
<td><strong>3(\frac{1}{2})</strong></td>
<td><strong>6 - 3</strong></td>
</tr>
</tbody>
</table>

**Note:** There will be an additional 30 hours in Geodesy, which will be devoted to field work.

### Sixth Year

**34 weeks part-time course**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.673</td>
<td>Engineering Geology</td>
<td>1 - 0</td>
<td>0 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>8.453</td>
<td>Geodesy</td>
<td>1(\frac{1}{2}) - 0</td>
<td>1(\frac{1}{2}) - 0</td>
<td>1(\frac{1}{2}) - 0</td>
</tr>
<tr>
<td>8.454</td>
<td>Map Projections</td>
<td>0 - 0</td>
<td>1 - 0</td>
<td>1 - 1(\frac{1}{2})</td>
</tr>
<tr>
<td>8.474</td>
<td>Photogrammetry</td>
<td>2 - 2</td>
<td>2 - 2</td>
<td>0 - 0</td>
</tr>
<tr>
<td>10.83</td>
<td>Mathematics</td>
<td>2 - 1</td>
<td>1(\frac{1}{2}) - 1</td>
<td>1(\frac{1}{2}) - 1</td>
</tr>
<tr>
<td>G30</td>
<td>Philosophy</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8(\frac{1}{2})</strong></td>
<td><strong>7 - 3</strong></td>
<td><strong>5 - 2(\frac{1}{2})</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Students must attend a survey camp of two weeks’ duration in the third and fourth weeks of third term to do field exercises in Geodesy in addition to 30 hours to be spent on laboratory and other work in connection with Geodesy.

### Seventh Year

**34 weeks part-time course**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.542</td>
<td>Geophysics</td>
<td>2 - 1</td>
<td>2 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>8.404</td>
<td>Map Compilation and Reproduction</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>8.65B</td>
<td>Harbours and Rivers Engineering</td>
<td>0 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>8.65C</td>
<td>Irrigation Engineering</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>8.66A</td>
<td>Engineering Construction</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
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<tr>
<td>Social Science Elective</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td></td>
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<tr>
<td>Seminar</td>
<td>0 - 3</td>
<td>0 - 5</td>
<td>0 - 6</td>
<td></td>
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<tr>
<td>Thesis</td>
<td>8 - 4</td>
<td>7 - 5</td>
<td>2 - 6</td>
<td></td>
</tr>
</tbody>
</table>
Master of Technology Courses in the School of Civil Engineering

The School of Civil Engineering offers full-time and part-time courses leading to the degree of Master of Technology in three separate fields of specialization:

(a) Concrete Structures, (b) Structural Analysis, (c) Hydraulics and Hydrology.

The full-time course extends over one academic year, the part-time over two years. Entrance to these courses will normally be restricted to graduates in civil engineering.

Students are referred to the conditions governing the award of this degree which are outlined on page 134.

COURSE VIII—MASTER OF TECHNOLOGY
(CONCRETE STRUCTURES)

This course consists of a comprehensive treatment of those phases of the analysis and design of reinforced and prestressed concrete structures not treated at undergraduate level. It is designed for engineers, practising as structural designers, who wish to specialise in the field of concrete structures.

FULL-TIME COURSE

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>8.115 Structural Analysis</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>8.118 Concrete Shells</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>8.119 Prestressed Concrete</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>8.120 Reinforced Concrete</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>8.215 Concrete Technology</td>
<td>1½—3</td>
<td>1½—3</td>
<td>0—0</td>
</tr>
<tr>
<td>Project</td>
<td>0—6</td>
<td>0—6</td>
<td>0—6</td>
</tr>
<tr>
<td></td>
<td>7½—15</td>
<td>7½—15</td>
<td>6—12</td>
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PART-TIME COURSE

FIRST YEAR

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
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<td>8.115 Structural Analysis</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
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<tr>
<td>8.119 Prestressed Concrete</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>8.120 Reinforced Concrete</td>
<td>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>Project</td>
<td>0—3</td>
<td>0—3</td>
<td>0—3</td>
</tr>
<tr>
<td></td>
<td>4½—7½</td>
<td>4½—7½</td>
<td>4½—7½</td>
</tr>
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</table>
## COURSE VIII-G2—MASTER OF TECHNOLOGY
### (STRUCTURAL ANALYSIS)

This course comprises the theoretical aspects of structural design and is intended for engineers practising as structural designers, who wish to specialise in analytical problems.

### FULL-TIME COURSE

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.115</td>
<td>Structural Analysis</td>
<td>1½-1½</td>
<td>1½-1½</td>
<td>1½-1½</td>
</tr>
<tr>
<td>8.116</td>
<td>Structural Computations</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>8.118</td>
<td>Concrete Shells</td>
<td>1½-1½</td>
<td>1½-1½</td>
<td>1½-1½</td>
</tr>
<tr>
<td>8.121</td>
<td>Theory of Elasticity</td>
<td>1½-1½</td>
<td>1½-1½</td>
<td>1½-1½</td>
</tr>
<tr>
<td>10.13/4</td>
<td>Mathematics</td>
<td>2-1</td>
<td>2-1</td>
<td>2-1</td>
</tr>
<tr>
<td>Project</td>
<td></td>
<td>0-6</td>
<td>0-6</td>
<td>0-6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>7½-13½</td>
<td>7½-13½</td>
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### PART-TIME COURSE

#### FIRST YEAR

<table>
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<tr>
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<th>Course Title</th>
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<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td>8.115</td>
<td>Structural Analysis</td>
<td>1½-1½</td>
<td>1½-1½</td>
<td>1½-1½</td>
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<tr>
<td>8.121</td>
<td>Theory of Elasticity</td>
<td>1½-1½</td>
<td>1½-1½</td>
<td>1½-1½</td>
</tr>
<tr>
<td>10.13/4</td>
<td>Mathematics</td>
<td>2-1</td>
<td>2-1</td>
<td>2-1</td>
</tr>
<tr>
<td>Project</td>
<td></td>
<td>0-3</td>
<td>0-3</td>
<td>0-3</td>
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<tr>
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#### SECOND YEAR

<table>
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<tr>
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<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.116</td>
<td>Structural Computations</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>8.118</td>
<td>Concrete Shells</td>
<td>1½-1½</td>
<td>1½-1½</td>
<td>1½-1½</td>
</tr>
<tr>
<td>Project</td>
<td></td>
<td>0-3</td>
<td>0-3</td>
<td>0-3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2½-6½</td>
<td>2½-6½</td>
<td>2½-6½</td>
</tr>
</tbody>
</table>
COURSE VIIIG3—MASTER OF TECHNOLOGY
(HYDRAULICS AND HYDROLOGY)

This course provides specialist training in theoretical and practical aspects of hydrologic investigations and hydraulic engineering.

**FULL-TIME COURSE**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>8.515 Hydrodynamics</td>
<td>2 — 2</td>
<td>1 — 1</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.516 Advanced Hydraulics</td>
<td>3 — 2</td>
<td>1½ — 1</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.517 Hydraulic Design</td>
<td>0 — 0</td>
<td>1½ — 0</td>
<td>3 — 1</td>
</tr>
<tr>
<td>8.519 Principles of Hydrology</td>
<td>3 — 2</td>
<td>1½ — 1</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.520 Hydrologic Design</td>
<td>0 — 0</td>
<td>1½ — 0</td>
<td>3 — 1</td>
</tr>
<tr>
<td>8.521 Laboratory Practice</td>
<td>0 — 2</td>
<td>0 — 2</td>
<td>0 — 2</td>
</tr>
<tr>
<td>10.13/4 Mathematics</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>2 — 1</td>
</tr>
<tr>
<td>Project</td>
<td>0 — 6</td>
<td>0 — 6</td>
<td>0 — 6</td>
</tr>
</tbody>
</table>

| Total | 10 — 15 | 9 — 12 | 8 — 11 |

Note—Two weeks during vacations will be devoted to hydrologic field work and inspections of major water projects.

**PART-TIME COURSE**

**FIRST YEAR**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>8.515 Hydrodynamics</td>
<td>1 — 1</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>8.516 Advanced Hydraulics</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>8.519 Principles of Hydrology</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>10.13/4 Mathematics</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>2 — 1</td>
</tr>
</tbody>
</table>

| Total | 6 — 4 | 6 — 4 | 6 — 4 |

Note—Six Saturdays (a total of 36 hours) will be devoted to laboratory practice.

**SECOND YEAR**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>8.517 Hydraulic Design</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>8.520 Hydrologic Design</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Project</td>
<td>0 — 6</td>
<td>0 — 6</td>
<td>0 — 6</td>
</tr>
</tbody>
</table>

| Total | 3 — 7 | 3 — 7 | 3 — 7 |

Note—Six Saturdays (a total of 36 hours) will be devoted to laboratory practice. Two weeks during vacations will be devoted to hydrologic field work and inspections to major water projects.

*54990—8 K 5137 225*
GRADUATE COURSES.

The School of Civil Engineering proposes to offer in 1959 a number of graduate courses in individual topics.

The courses are designed for qualified civil engineers desiring instruction beyond the level of the Bachelor's degree in one or more fields of study. Completion of such courses may constitute partial fulfilment of requirements for an advanced degree of this University.

The proposed courses are listed below. Further details can be obtained from the Professor of Civil Engineering.

- 8.115 Structural Analysis.
- 8.116 Structural Computations.
- 8.118 Analysis of Concrete Shell Roofs.
- 8.119 Prestressed Concrete Design.
- 8.215 Concrete Technology.
- 8.415 Advanced Surveying.
- 8.515 Hydrodynamics.
- 8.516 Advanced Hydraulics.
- 8.517 Hydraulic Design.
- 8.518 Hydro-Electric Engineering.
- 8.520 Hydrologic Design.
- 8.915 Experimental Stress Analysis.
SCHOOL OF WOOL TECHNOLOGY

To meet a potential threat from cheaply produced man-made fibres, wool producers, by the implementation of the Wool Use Promotion Act of 1945 and subsequent legislation, have taken decisive action to change from the empirical development of Australia's pastoral resources. A programme of planned improvement of efficiency through research, increased extension services, and adequate publicity for wool is already under way. The full development of this plan will require specialist personnel trained to give service to the pastoral industry.

To meet this need the School of Wool Technology offers a full-time course in wool technology leading to the degree of Bachelor of Science (Pass or Honours), and a full-time and a part-time course in wool commerce leading to the degree of Bachelor of Commerce (Pass or Honours).

COURSE IX—WOOL TECHNOLOGY

In the past, research workers, teachers, extension workers, agricultural journalists, valuers, managers of estates and other professional workers for the pastoral industry, have been in part drawn from university courses in traditional subjects such as pure science, engineering, agriculture and veterinary science. More often, their training has been at diploma and certificate level in agricultural and technical colleges without matriculation standard of entry. In far too many cases senior workers have had no opportunity for tertiary education, and their knowledge, usually highly specialised, comes from long practical experience and from personal contacts in the industry. This is especially true in the field of wool commerce, where men aspiring to the highest positions in wool broking and wool buying must get a substantial part of their training outside of formal instruction, or spend a year or more in an overseas wool centre such as Bradford, Leeds or Boston.

The course aims to provide a pool of graduates in whom has been inculcated a liberal scientific outlook, and the habit of exact and logical thought. These men will be familiar with the latest developments in fields relating to wool production, wool commerce, and wool utilisation. They will also be good practical wool men, capable of handling wool and recognising its technical characteristics, through facility in the use of subjective appraisal on which the whole wool trade is based. A report prepared by an expert of the Australian Wool Realisation Commission has emphasised the lack of sufficient liaison between experts in wool growing, the selling of wool and wool manufacture, and personnel of scientific organisations. One broad aim of this course is to link producers, buyers and users of wool.
Trainees, for example, will be given opportunity, on machines of the Textile Department, of following particular lots of wool through all processing operations, and observing for themselves the effect in manufacture of characteristics apparent in the raw material.

The course consists of four years full-time study, but the second and third years each provide for a period of approximately six months approved work in the industry to gain practical experience.

The first year of the course consists of a basic training in general science; vocational subjects essential to all branches of the wool industry are given in the second and third years, and in the final year provision is made for students who wish to specialise in either wool production or wool commerce. The fourth year work will include a project which will give each student opportunity to express initiative and originality. By association with lecturers and teachers who are engaged in research already under way in this School, we aim to provoke both curiosity and interest in students who will themselves spend effort in contributing to the advance of efficiency.

Requirements for Industrial Training

Each student is required to complete satisfactorily twelve months' practical work on approved sheep properties. The twelve months need not necessarily be consecutive, and in the case of a student who has done practical work before entering the course this may be taken into consideration in determining any further time required.

In order to obtain recognition of practical work carried out, students shall:

1. Make application for the approval of the properties where they intend to carry out the required practical work, such application to contain a brief description of the property and to be in the hands of the Head of the School at the earliest possible date. Students should endeavour to obtain experience on extensive, marginal and intensive properties.

2. At the conclusion of the work, produce certificates from employers stating periods of employment and reporting on the quality of the student's work.

3. Supply reports as hereunder:

   (i) On work carried out in the long vacation—

      (a) Monthly interim reports setting out briefly the nature of work engaged in, with any notes of topical interest. The first interim report shall include
A description of the property, including details of farm buildings, dip and yards, plant and equipment, stock numbers (in age and sex groups), and such features as water supplies, improved pastures, crops, etc. A sketch plan of the property should also be included.

(b) A final report to be submitted within a month of resumption of lectures. The final report should embody a report on a district basis in general and the property on which the student has worked in particular. The development of farming practices, the salient features of management in relation to the environment, pasturage, rainfall and distribution, water supplies, types of stock and breeding policies, statistics, etc., should receive consideration. The size and capacity of the farm buildings should be given particular note, and sketch plans with the principal measurements will be of value. Photographs will also be of value in illustrating features. Where applicable, details of pasture mixtures, rate of sowing for crops and manurial treatment should be recorded, as should also labour performances (both manual and with machines), and costs.

(ii) On work carried out in short vacations—A brief report to be submitted within one week of the resumption of the term.

(iii) By students who carry out twelve consecutive months on a property or properties—

(a) Interim reports to be submitted every two months.

(b) Final reports to be submitted by 31st March in the year of resumption of studies. The nature of the interim and final reports shall be as required for work carried out in the long vacation.

Note.—Students will find that a loose-leaf note-book suitably indexed will be of great value for recording factual material, costs, material requirements for various jobs, etc.

Students are also encouraged to submit questions relating to any problems they may meet with in the course of their practical work.
### COURSE IX—WOOL TECHNOLOGY

#### FIRST YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<td>Hours per week</td>
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<td>lec. lab./tut.</td>
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<tr>
<td>1.41 Physics</td>
<td>3</td>
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<tr>
<td>2.41b General Chemistry</td>
<td>3</td>
<td>6</td>
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<tr>
<td>10.91 Mathematics</td>
<td>4</td>
<td>2*</td>
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<tr>
<td>17.11 Biochemistry</td>
<td>0</td>
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<tr>
<td>17.21 General Biology</td>
<td>2</td>
<td>3</td>
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<tr>
<td>G10 English</td>
<td>2</td>
<td>0</td>
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<tr>
<td>G20 History</td>
<td>1</td>
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<td><strong>Total</strong></td>
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* Tutorial

#### SECOND YEAR

(24 weeks day course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
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<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>Hours per week</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>9.12 Livestock Production I</td>
<td>3</td>
</tr>
<tr>
<td>9.22 Agronomy</td>
<td>3</td>
</tr>
<tr>
<td>9.52 Wool</td>
<td>1</td>
</tr>
<tr>
<td>10.92 Statistics</td>
<td>2</td>
</tr>
<tr>
<td>13.92 General Textiles (Yarns)</td>
<td>3</td>
</tr>
<tr>
<td>17.12 Biochemistry</td>
<td>2</td>
</tr>
<tr>
<td>17.22 Biology</td>
<td>2</td>
</tr>
<tr>
<td>G30 Philosophy</td>
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<tr>
<td><strong>Total</strong></td>
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21 weeks for remainder of year to be spent in activities concerned with wool production.

#### THIRD YEAR

(24 weeks day course)

<table>
<thead>
<tr>
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<td>lec. lab./tut.</td>
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<tr>
<td>Hours per week</td>
<td>lec. lab./tut.</td>
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<tr>
<td>9.13 Livestock Production IIa</td>
<td>3</td>
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<tr>
<td>9.13 Livestock Production IIb</td>
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<tr>
<td>9.33 Economics</td>
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<tr>
<td>9.53 Wool</td>
<td>0</td>
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<tr>
<td>9.63 Physiology</td>
<td>2</td>
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<tr>
<td>13.93 General Textiles (Fabrics)</td>
<td>3</td>
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<tr>
<td>Social Science Elective</td>
<td>2</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>15-15</strong></td>
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</table>

Two weeks immediately following the final examinations will be spent in attendance at a course in Shearing Machinery, Installation and Servicing, and Experting. Nineteen weeks of the remainder of the year to be spent in activities concerned with wool production.
FOURTH YEAR

(34 weeks day course.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1 lec.</th>
<th>Term 1 lab./tut.</th>
<th>Term 2 lec.</th>
<th>Term 2 lab./tut.</th>
<th>Term 3 lec.</th>
<th>Term 3 lab./tut.</th>
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<tbody>
<tr>
<td>9.74 Fibre Science</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td></td>
<td></td>
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<tr>
<td>9.84 Project</td>
<td>0 — 5</td>
<td>0 — 5</td>
<td>0 — 5</td>
<td>0 — 5</td>
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<td></td>
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<tr>
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<td>2 — 0</td>
<td>2 — 0</td>
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2 — 7 4 — 7 4 — 7

Plus elective subjects of either Option I or Option II.

**Option I.—Wool Production**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1 lec.</th>
<th>Term 1 lab./tut.</th>
<th>Term 2 lec.</th>
<th>Term 2 lab./tut.</th>
<th>Term 3 lec.</th>
<th>Term 3 lab./tut.</th>
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<tr>
<td>9.104 Nutrition</td>
<td>3 — 2</td>
<td>3 — 2</td>
<td>3 — 2</td>
<td>3 — 2</td>
<td></td>
<td></td>
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<tr>
<td>9.124 Farm Management and Mechanisation</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td></td>
<td></td>
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<tr>
<td>9.14 Livestock Production III</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.24 Pastoral Agronomy</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td></td>
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<tr>
<td>9.94 Genetics</td>
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<td>2 — 1</td>
<td>2 — 1</td>
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12 — 5 12 — 5 12 — 5

**Option II.—Wool Commerce**

<table>
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<th>Term 1 lab./tut.</th>
<th>Term 2 lec.</th>
<th>Term 2 lab./tut.</th>
<th>Term 3 lec.</th>
<th>Term 3 lab./tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.134 Introductory Accounting</td>
<td>2 — 2*</td>
<td>2 — 2*</td>
<td>2 — 2*</td>
<td>2 — 2*</td>
<td></td>
<td></td>
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<tr>
<td>9.144 Commercial Law</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.154 Synthetic Fibres</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.34 Banking, Currency, Foreign Exchange</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td></td>
<td></td>
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<tr>
<td>9.44 Yarn Manufacture (Wool)</td>
<td>6 — 0</td>
<td>6 — 0</td>
<td>6 — 0</td>
<td>6 — 0</td>
<td></td>
<td></td>
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<tr>
<td>9.54 Wool</td>
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<td>5 — 0</td>
<td>5 — 0</td>
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18 — 2 18 — 2 18 — 2

* Tutorial

231
COURSE IXA—WOOL COMMERCE

This course provides a training for persons entering the wool broking or wool buying professions, and aims at developing the skills and knowledge required by them. In addition to giving a training in the subjective ability to recognise and appraise wool types, the course provides a background knowledge of such commercial fields as economics, accountancy, statistics, psychology and commercial law. Students are required to complete at least six months practical training during the long vacations.

FIRST YEAR
(34 weeks day course)

<table>
<thead>
<tr>
<th>Hours per week</th>
</tr>
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<tbody>
<tr>
<td>Term 1</td>
</tr>
<tr>
<td>lec. lab./tut.</td>
</tr>
</tbody>
</table>

| 12.91 | Psychology I (Com.) | 2 - 0 | 2 - 0 | 2 - 0 |
| 14.11 | Accounting I | 2 - 2 | 2 - 2 | 2 - 2 |
| 15.11 | Descriptive Economics | 2 - 0 | 2 - 0 | 2 - 0 |
| 15.12 | Economics I | 1 1/2 - 1/2 | 1 1/2 - 1/2 | 1 1/2 - 1/2 |
| G13 | English | 2 - 0 | 2 - 0 | 2 - 0 |
| or | History | 1 - 0 | 1 - 0 | 1 - 0 |
| G30.1 | Logic | 10 1/2 - 2 1/2 | 10 1/2 - 2 1/2 | 10 1/2 - 2 1/2 |

SECOND YEAR
(34 weeks day course)

<table>
<thead>
<tr>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1</td>
</tr>
<tr>
<td>lec. lab./tut.</td>
</tr>
</tbody>
</table>

| 9.802a | Wool I | 1 - 3 | 1 - 3 | 1 - 3 |
| 9.802b | Wool II | 1 - 3 | 1 - 3 | 1 - 3 |
| 9.812 | Sheep Husbandry | 2 - 0 | 2 - 0 | 2 - 0 |
| 14.41 | Law I | 1 - 0 | 1 - 0 | 1 - 0 |
| 15.13 | Economics II | 1 1/2 - 1/2 | 1 1/2 - 1/2 | 1 1/2 - 1/2 |
| 15.21 | Statistical Methods I | 1 1/2 - 1/2 | 1 1/2 - 1/2 | 1 1/2 - 1/2 |
| 9.802a | Wool I | 8 - 7 | 8 - 7 | 8 - 7 |

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# Third Year

**Third Year**

*(34 weeks day course)*

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
<td>9.803</td>
<td>Wool III</td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td>9.823</td>
<td>Wool Textiles I</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>14.15</td>
<td>Accounting Control</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>14.42</td>
<td>Law II</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
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<tr>
<td>15.14</td>
<td>Economics III</td>
<td>1 - 1/4</td>
<td>1 - 1/4</td>
<td>1 - 1/4</td>
</tr>
<tr>
<td>15.22</td>
<td>Statistical Methods II</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td></td>
<td>2 - 0</td>
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<th>Term 3</th>
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<tbody>
<tr>
<td></td>
<td>9 1/2 - 3 1/2</td>
<td>9 1/2 - 3 1/2</td>
<td>9 1/2 - 3 1/2</td>
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</table>

* One of: Business Finance, Production, Marketing, or any other approved subject.

# Fourth Year

**Fourth Year**

*(34 weeks day course)*

<table>
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<tr>
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<th>Term 3</th>
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<tbody>
<tr>
<td>9.804</td>
<td>Wool IV</td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td>9.814</td>
<td>Sheep Production</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
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<tr>
<td>9.824</td>
<td>Wool Textiles II</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>15.15</td>
<td>Economics IV</td>
<td>1 1/4 - 1/4</td>
<td>1 1/4 - 1/4</td>
<td>1 1/4 - 1/4</td>
</tr>
<tr>
<td>G30.2</td>
<td>Scientific Method</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
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<tr>
<td>Seminar in Wool Technology</td>
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<td>1 - 0</td>
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<th>Term 3</th>
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<tr>
<td></td>
<td>8 1/2 - 3 1/2</td>
<td>8 1/2 - 3 1/2</td>
<td>8 1/2 - 3 1/2</td>
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</table>

# Course IXb—Wool Commerce

The part-time course extends over six years of evening study.

# First Year

**(34 weeks part-time course)**

<table>
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<tr>
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<tr>
<td>14.11</td>
<td>Accounting I</td>
<td>2 - 2</td>
<td>2 - 2</td>
<td>2 - 2</td>
</tr>
<tr>
<td>15.11</td>
<td>Descriptive Economics</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
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<tr>
<td>G13</td>
<td>English</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
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<tr>
<td>G24</td>
<td>History</td>
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<th>Term 3</th>
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<tr>
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<td>7 - 2</td>
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**SECOND YEAR**

*(34 weeks part-time course)*

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<th>Term 3</th>
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<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td><strong>Sheep Husbandry</strong></td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td><strong>Psychology I (Com.)</strong></td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td><strong>Law I</strong></td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td><strong>Economics I</strong></td>
<td>1(\frac{1}{2}) - (\frac{1}{2})</td>
<td>1(\frac{1}{2}) - (\frac{1}{2})</td>
<td>1(\frac{1}{2}) - (\frac{1}{2})</td>
</tr>
<tr>
<td><strong>Statistical Methods I</strong></td>
<td>1(\frac{1}{2})</td>
<td>1(\frac{1}{2})</td>
<td>1(\frac{1}{2})</td>
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<td></td>
<td>8 - 1</td>
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**THIRD YEAR**

*(34 weeks part-time course)*

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<th>Term 3</th>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td><strong>Wool I</strong></td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td><strong>Accounting Control</strong></td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
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<tr>
<td><strong>Law II</strong></td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td><strong>Economics II</strong></td>
<td>1(\frac{1}{2}) - (\frac{1}{2})</td>
<td>1(\frac{1}{2}) - (\frac{1}{2})</td>
<td>1(\frac{1}{2}) - (\frac{1}{2})</td>
</tr>
<tr>
<td><strong>Statistical Methods II</strong></td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td></td>
<td>5(\frac{1}{2}) - 3(\frac{1}{2})</td>
<td>5(\frac{1}{2}) - 3(\frac{1}{2})</td>
<td>5(\frac{1}{2}) - 3(\frac{1}{2})</td>
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**FOURTH YEAR**

*(34 weeks part-time course)*

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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td><strong>Wool II</strong></td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td><strong>Economics III</strong></td>
<td>1(\frac{1}{2}) - (\frac{1}{2})</td>
<td>1(\frac{1}{2}) - (\frac{1}{2})</td>
<td>1(\frac{1}{2}) - (\frac{1}{2})</td>
</tr>
<tr>
<td><strong>Scientific Method</strong></td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td><strong>Elective Subject</strong></td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td></td>
<td>5(\frac{1}{2}) - 3(\frac{1}{2})</td>
<td>5(\frac{1}{2}) - 3(\frac{1}{2})</td>
<td>5(\frac{1}{2}) - 3(\frac{1}{2})</td>
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* One of Business Finance, Production, Marketing, or any other approved subject.
**Fifth Year**

(34 weeks part-time course)

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<th>Term 3</th>
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<tr>
<td></td>
<td>lec.</td>
<td>lab./tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>9.803 Wool III</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>9.823 Wool Textiles I</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>15.15 Economics IV</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
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**Sixth Year**

(34 weeks part-time course)

<table>
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<th>Term 3</th>
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<tr>
<td></td>
<td>lec.</td>
<td>lab./tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>9.804 Wool IV</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>9.814 Sheep Production</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>9.824 Wool Textiles II</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Seminar in Wool Technology</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
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<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>lab./tut.</td>
<td>lec.</td>
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<tr>
<td></td>
<td>6 — 3</td>
<td>6 — 3</td>
<td>6 — 3</td>
</tr>
</tbody>
</table>
SCHOOL OF MATHEMATICS

Within the structure of the Science course, details of which are set out on page 304, the School of Mathematics conducts sequences of mathematical subjects leading to the degree of Bachelor of Science (Pass or Honours) with majors in mathematics or in mathematical statistics. These courses provide a training for persons entering fields with a high mathematical content—in industry, research and governmental activities. Intending teachers of mathematics in the secondary schools are also catered for.

With the increasing quantification of many branches of human effort, with the developing awareness of the applicability of mathematical arguments to non-traditional situations ("operational research"), and with the advent of high speed computing devices ("electronic brains"), it is becoming more widely realized that the incidental mathematical training acquired in the traditional professional courses in science, technology and engineering is rarely adequate for the new range of problems so exposed. Because of the frequency with which statistical questions arise, special provision is made for the study of theoretical statistics.

The Science course is offered on both a full-time and a part-time basis. The full-time course extends over three years for a Pass degree and over four years for an Honours degree, while the part-time course extends over seven years for a Pass degree.

In addition to the other subjects prescribed by the regulations, the subjects of mathematics major are:

<table>
<thead>
<tr>
<th>Year I</th>
<th>Year II</th>
<th>Year III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics I</td>
<td>Mathematics II (Pure)</td>
<td>Mathematics III (Pure)</td>
</tr>
<tr>
<td>Mathematics II (Applied)</td>
<td>Mathematics III (Applied)</td>
<td></td>
</tr>
</tbody>
</table>

and those of the statistics major are:

<table>
<thead>
<tr>
<th>Year I</th>
<th>Year II</th>
<th>Year III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics I</td>
<td>Mathematics II (Pure)</td>
<td>Mathematics III (Pure)</td>
</tr>
<tr>
<td>Theory of Statistics I</td>
<td>Theory of Statistics II</td>
<td></td>
</tr>
</tbody>
</table>

The four-year course for an Honours degree is intended primarily for professional mathematicians and statisticians, but will prove of interest also to intending specialists in fields such as theoretical physics and engineering.

In addition to the above courses, the School of Mathematics provides a variety of mathematical and statistical subjects directed specifically to students of individual branches of science, technology and engineering. These are described under their appropriate headings in the section "Description of Subjects of Instruction".

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The architect is occupying an increasingly important position in the development of Australia. His contribution to society is primarily that of a planner. It includes understanding of the building needs of communities and individuals, skill in the effective and orderly disposition of interior space and communication, and the design of economic and durable structures. In this he is concerned with research into functional needs and the best methods of construction. His main work as an artist is to fuse functional planning and scientific structure into an aesthetic unity which gives lasting pleasure. In architecture, science and art are one: they are absolutely inter-dependent and complementary. These ideas have been kept in mind in planning the syllabus of study.

The special feature of this course is that the three main essentials—architecture as an art, architecture as a science, and architecture as a practical profession—are all given prominence.

The early stages provide a fundamental training in the basic sciences underlying building technology. This is a feature of the course which is most important for modern architects who are called upon to use new materials and new building methods and express new ideas in the present scientific age. Instruction in the principles of chemistry and physics as they affect the architect is included as a foundation to the studies in building science. All students receive and undertake a certain amount of theoretical and practical training in the building trades and crafts. A further feature of the course is a basic training in modern structures—with the relevant amount of mathematics—followed by further optional study in advanced structures in the later years for those students who wish to concentrate further on structural design in steel and reinforced concrete.

Concurrently with these scientific and structural subjects, the aesthetic sensibilities and creative abilities of the student are developed from the beginning with visual design and colour (included in Freehand Drawing, and History and Theory of Architecture) and later with more advanced work on architectural design and construction, civic design, etc.

Further, two principles established by the University relating to all courses have been applied, viz., that practical experience in employment of a planned nature is to be a feature of all courses, and secondly that social and cultural needs must be catered for if a professional man is to take his rightful place in the community. The lectures in the Humanities and the Fine Arts, which are an integral part of the course, cater for this latter need. Practical employment is included during the second and third years, and for
some students also in the fourth, fifth and sixth years. Before qualifying for a degree, the student must provide evidence of at least thirty months' approved practical experience.

The details of the practical training requirements are as follows:— At the end of the first year or early in their courses all students should obtain approved experience in out-door building for a minimum of six months either in the employment of an architect or a builder. For the remainder of their courses, except for periods of full-time study and vacations, all students must be in approved employment under the personal direction of a registered architect. During the first term of the second and subsequent years each student must discuss with his Year Master the nature of his employment (or proposed employment), and present a short report to the Head of the School outlining the kind of work he is doing (or proposes to do).

The course leads to the degree of Bachelor of Architecture and is fully recognised by the Royal Institute of British Architects, the Royal Australian Institute of Architects, and by the New South Wales Board of Architects for legal registration as an architect.

At present the Architecture course conducted by the University admits to Associateship of the R.I.B.A. and the R.A.I.A. without further examination, but it is anticipated that from 1st January, 1961, professional institutions throughout the British Commonwealth will require all candidates for Associateship to provide evidence of at least two years' practical experience, one year of which must be after completion of a recognised course. These institutions may also set their own examination in Professional Practice—in addition to that provided by recognised schools.

The syllabus of the Architecture degree course has recently been revised and the new course will be implemented year by year, the first year commencing in 1958. Students enrolled in any year of the degree course in 1957 will complete the old syllabus as set out in the 1957 Calendar.

Students enrolling in the revised course may complete the requirements for the degree in five years, seven terms full-time and eight terms part-time, or in six years of mainly part-time study. The five-year syllabus is known as course XIA and the six year syllabus as XIB.

On behalf of the Department of Technical Education the School offers in Sydney diploma courses in Architecture, Building, and Quantity Surveying, and in Newcastle, the diploma course in Architecture.
COURSE XI A—ARCHITECTURE

Course XI A extends over five years and leads to the degree of Bachelor of Architecture. Students taking this course will attend the University full-time in first year, part-time in the second and third years, and for one part-time term and two full-time terms in each of the fourth and fifth years.

FIRST YEAR

(34 weeks full-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.91 Physics</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>0 — 0</td>
</tr>
<tr>
<td>10.51 Mathematics*</td>
<td>0 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>11.11 Descriptive Geometry</td>
<td>0 — 2</td>
<td>0 — 2</td>
<td>0 — 2</td>
</tr>
<tr>
<td>11.21 Drawing—(a) Freehand</td>
<td>0 — 3</td>
<td>0 — 3</td>
<td>0 — 3</td>
</tr>
<tr>
<td>(b) Architectural</td>
<td>0 — 5</td>
<td>0 — 5</td>
<td>0 — 6</td>
</tr>
<tr>
<td>11.41 History of Architecture (General)</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>11.51 Building Science I (Equivalent time)</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>2 — 0</td>
</tr>
<tr>
<td>11.61 Building Trades and Crafts (Equivalent time)</td>
<td>0 — 3</td>
<td>0 — 3</td>
<td>0 — 7</td>
</tr>
<tr>
<td>11.71 Building Construction I (Surveys and Reports)</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 8</td>
</tr>
<tr>
<td>G10 English</td>
<td>2 — 0</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td></td>
<td>8 — 20</td>
<td>10 — 20</td>
<td>6 — 26</td>
</tr>
</tbody>
</table>

* Students matriculating to the University with General Mathematics only are required to complete a bridge course in mathematics held in first term for two hours per week.

SECOND YEAR

(3½ weeks part-time course over three terms requiring attendance for two or three half-days and evenings per week)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.22 Materials Laboratory</td>
<td>0 — 2</td>
<td>0 — 2</td>
<td>0 — 2</td>
</tr>
<tr>
<td>8.42 Land Surveying (Equivalent time)</td>
<td>1 — 0</td>
<td>0 — 1</td>
<td>0 — 1</td>
</tr>
<tr>
<td>11.102 Theory of Structures II</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>11.22 Freehand Drawing II</td>
<td>0 — 2½</td>
<td>0 — 2½</td>
<td>0 — 2½</td>
</tr>
<tr>
<td>11.42 History of Architecture II</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>11.52 Building Science II (Equivalent time)†</td>
<td>½ — 0</td>
<td>¾ — 0</td>
<td>¾ — 0</td>
</tr>
<tr>
<td>11.72 Building Construction II (incl. Meas. Survs.)</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>11.82 Theory of Architecture A*</td>
<td>1 — 1</td>
<td>1 — 1</td>
<td>1 — 2</td>
</tr>
<tr>
<td>G20 History</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td></td>
<td>7½ — 7½</td>
<td>6½ — 8½</td>
<td>4½ — 9½</td>
</tr>
</tbody>
</table>

* Includes some design and analytical studies in architectural composition.
† See footnote next page.
### Third Year

(34 weeks part-time course over three terms requiring attendance for two or three half-days and evenings per week)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.103</td>
<td>Theory of Structures III</td>
<td></td>
</tr>
<tr>
<td>11.203</td>
<td>Building Services A</td>
<td></td>
</tr>
<tr>
<td>11.43</td>
<td>History of Architecture III</td>
<td></td>
</tr>
<tr>
<td>11.53</td>
<td>Building Science III (Equivalent time)†</td>
<td></td>
</tr>
<tr>
<td>11.73</td>
<td>Building Construction III</td>
<td></td>
</tr>
<tr>
<td>11.83</td>
<td>Theory of Architecture B</td>
<td></td>
</tr>
<tr>
<td>11.93</td>
<td>Architectural Design III</td>
<td></td>
</tr>
<tr>
<td>G30</td>
<td>Philosophy</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-0</td>
<td>-0</td>
<td>1-0</td>
</tr>
<tr>
<td>1-1</td>
<td>-0</td>
<td>1-0</td>
</tr>
<tr>
<td>0-5</td>
<td>-0</td>
<td>0-5</td>
</tr>
<tr>
<td>2-0</td>
<td>-0</td>
<td>2-0</td>
</tr>
<tr>
<td>0-0</td>
<td>-0</td>
<td>0-0</td>
</tr>
<tr>
<td>8-6</td>
<td>8-6</td>
<td>6-6</td>
</tr>
</tbody>
</table>

In addition 16 hours will be devoted to elementary geology and petrology.

### Fourth Year

(34 weeks course requiring part-time attendance in term 1 and full-time attendance in terms 2 and 3)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.134</td>
<td>Specifications</td>
<td></td>
</tr>
<tr>
<td>11.204</td>
<td>Building Services B</td>
<td></td>
</tr>
<tr>
<td>11.44</td>
<td>History of Architecture IV</td>
<td></td>
</tr>
<tr>
<td>11.54</td>
<td>Building Science IV (Building Research and Acoustics)†</td>
<td></td>
</tr>
<tr>
<td>11.74</td>
<td>Building Construction IV (Structures)</td>
<td></td>
</tr>
<tr>
<td>11.94</td>
<td>Architectural Design IV</td>
<td></td>
</tr>
<tr>
<td>11.95</td>
<td>Architectural Design V</td>
<td></td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-0</td>
<td>-0</td>
<td>1-0</td>
</tr>
<tr>
<td>2-0</td>
<td>-0</td>
<td>2-0</td>
</tr>
<tr>
<td>0-0</td>
<td>-0</td>
<td>0-0</td>
</tr>
<tr>
<td>2-0</td>
<td>-0</td>
<td>2-0</td>
</tr>
<tr>
<td>0-0</td>
<td>-16</td>
<td>0-0</td>
</tr>
<tr>
<td>5½-0</td>
<td>6⅔-16</td>
<td>6⅓-16</td>
</tr>
</tbody>
</table>

† Building Science in years 2, 3 and 4 will be taken in groups. Times given are equivalent.
### FIFTH YEAR

(34 weeks course requiring full-time attendance in terms 1 and 2 and part-time attendance in term 3)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.105</td>
<td>Structural Design</td>
<td>1-1</td>
<td>1-1</td>
<td>1-1</td>
</tr>
<tr>
<td>11.115</td>
<td>Planning Research</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>11.125</td>
<td>Professional Practice</td>
<td>0-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>11.176</td>
<td>Architectural Science and Research Thesis</td>
<td>0-4</td>
<td>0-4</td>
<td>0-0</td>
</tr>
<tr>
<td>11.186</td>
<td>Civic Architecture</td>
<td>0-2</td>
<td>0-2</td>
<td>0-2</td>
</tr>
<tr>
<td>11.196</td>
<td>Town Planning</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>11.215</td>
<td>Estimating</td>
<td>0-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>11.225</td>
<td>Architectural Administration</td>
<td>0-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>11.96</td>
<td>Architectural Design VI</td>
<td>0-16</td>
<td>0-0</td>
<td>0-0</td>
</tr>
</tbody>
</table>

Note—The hours given are for minimum attendance times; they do not represent the total hours which may be spent by the student in the studios, the library, or private study.

### COURSE XIb—ARCHITECTURE

The Architecture degree course also may be taken over six years. At the end of the third year of the syllabus outlined above (course XIa) students may apply to the Head of the School to complete the remaining subjects of the course in three further years. Part-time attendance only is required in these three years with the exception of the first term of the sixth year when students will attend full-time.

### FOURTH YEAR

(34 weeks part-time course over three terms)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.134</td>
<td>Specifications</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>11.204</td>
<td>Building Services B</td>
<td>2-0</td>
<td>2-0</td>
<td>2-0</td>
</tr>
<tr>
<td>11.54</td>
<td>Building Science IV (Building Research and Acoustics) (Equivalent)</td>
<td>½-0</td>
<td>½-0</td>
<td>½-0</td>
</tr>
<tr>
<td>11.74</td>
<td>Building Construction IV (Structures)</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>11.94</td>
<td>Architectural Design IV</td>
<td>0-3</td>
<td>0-3</td>
<td>0-3</td>
</tr>
<tr>
<td></td>
<td>History of Architecture (Special)</td>
<td>1-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td></td>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>0-0</td>
<td>2-0</td>
<td>2-0</td>
</tr>
</tbody>
</table>

Note—The hours given are for minimum attendance times; they do not represent the total hours which may be spent by the student in the studios, the library, or private study.

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**Fifth Year**

(34 weeks part-time course over three terms)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.105</td>
<td>Structural Design or M</td>
<td>1-1</td>
<td>1-1</td>
<td>1-1</td>
</tr>
<tr>
<td>11.115</td>
<td>Planning Research</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>11.125</td>
<td>Professional Practice</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>11.215</td>
<td>Estimating</td>
<td>0-3</td>
<td>0-3</td>
<td>0-3</td>
</tr>
<tr>
<td>11.95</td>
<td>Architectural Design VI</td>
<td>3-4</td>
<td>3-4</td>
<td>3-4</td>
</tr>
</tbody>
</table>

**Sixth Year**

(34 weeks course over three terms; term 1 full-time, terms 2 and 3 part-time)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.176</td>
<td>Architectural Science and Research Thesis</td>
<td>0-4</td>
<td>0-1</td>
<td>0-1</td>
</tr>
<tr>
<td>11.186</td>
<td>Civic Architecture</td>
<td>0-0</td>
<td>0-3</td>
<td>0-3</td>
</tr>
<tr>
<td>11.196</td>
<td>Town Planning</td>
<td>2-0</td>
<td>0-2</td>
<td>0-0</td>
</tr>
<tr>
<td>11.225</td>
<td>Architectural Administration</td>
<td>0-0</td>
<td>1-0</td>
<td>0-0</td>
</tr>
<tr>
<td>11.96</td>
<td>Architectural Design VI</td>
<td>0-16</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-20</td>
<td>1-6</td>
<td>0-4</td>
</tr>
</tbody>
</table>

**Note**—The hours given are for minimum attendance times; they do not represent the total hours which may be spent by the student in the studios, the library, or private study.

**Course XI—Architecture (Old Syllabus)**

From 1958, Course XI is being superseded by the revised syllabus set out above. In 1959, however, stages 3 to 6 of the old course will be available to students who were enrolled in any stage of the course in 1957. The syllabus of the course is set out in the 1957 Calendar.
Holders of the diploma in Architecture (A.S.T.C.) are required to complete the following additional work in order to qualify for the degree of Bachelor of Architecture.

**Hours per week:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. G13</td>
<td>English or G23 History or G33 Philosophy</td>
<td>2</td>
</tr>
<tr>
<td>1. G43</td>
<td>Economics or G53 Government or G63 Psychology or G83 Sociology</td>
<td>2</td>
</tr>
<tr>
<td>2. 11.176</td>
<td>Architectural Science and Research Thesis*</td>
<td>24</td>
</tr>
<tr>
<td>3. Any two of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 1.91</td>
<td>Physics</td>
<td>4</td>
</tr>
<tr>
<td>7.502</td>
<td>Geology</td>
<td>1</td>
</tr>
<tr>
<td>8.22</td>
<td>Materials of Construction</td>
<td>2</td>
</tr>
<tr>
<td>10.51</td>
<td>Mathematics</td>
<td>2</td>
</tr>
<tr>
<td>11.91</td>
<td>Building Science</td>
<td>4</td>
</tr>
</tbody>
</table>

*In special circumstances a student may apply to complete this subject by part-time study over three terms. The holder of a diploma with Credit or Honours may apply to be exempted from this subject, provided that—

(a) at the completion of his Conversion course he will have had two years standing as a diplomate;

(b) he gained a Credit or Distinction for the research or design thesis in the diploma course;

(c) he provides evidence to the Faculty that in his professional career he has pursued some aspect of study in Architectural Science and Research which, together with the diploma thesis, is regarded as equivalent to the subject of 11.176 Architectural Science and Research thesis.
SCHOOL OF APPLIED PSYCHOLOGY

It has become a platitude that modern civilisation can command the technical power to produce all that is needed to destroy hunger, want, and fear, but it has failed to develop the social organisation and skills needed to use this power satisfyingly and effectively. There is a lag in knowledge of how to create and control a social structure which can maintain stability and its highest values whilst adapting its form to the ceaseless advance of material invention. To make an industrial society work, we must understand its human as well as technical aspects. Applied Psychology is one of the technologies concerned with such a study of human behaviour. It seeks principles to explain, understand and predict human action. It deals with practical situations but it is based on, and makes its own contributions to, a solid theoretical framework which it shares with academic psychology. It is thus both a technology and a social science.

There are increasing demands for professional psychologists in the fields of industrial psychology, personnel management, "human" engineering (the design of machines and processes allowing for the qualities of the human operator), educational and vocational guidance, clinical psychology, child development, selection and placement in the Armed Services, and teaching and research.

A number of courses in Applied Psychology are offered:

Course XIIB: A five year course in Applied Psychology leading to the degree of Bachelor of Science with electives in counselling and industrial psychology.

Courses XIIa and XIIb: Respectively a full-time and a part-time course in Applied Psychology leading to the degree of Bachelor of Commerce.

In addition, Psychology may be taken as a major sequence in the Science course, details of which are set out on page 304 and it also forms an important part of the courses in Industrial Relations leading to the degree of Bachelor of Commerce, details of which are set out on pages 275 to 280.

COURSE XIIb—APPLIED PSYCHOLOGY

The first two years of the course leading to the degree of Bachelor of Science are aimed at giving the student a firm background of psychological theory, such other sciences as he will need in further studies (i.e., mathematics, biology and physics) and a leavening of arts subjects such as English, history and philosophy. In the third year, the subjects are basic to the courses included in the fourth and fifth years in which the student specialises in either industrial psychology or counselling.
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. It is concerned with the study of 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 theory and practical work.

The elective in counselling provides training for people engaged in counselling activities, employed in business and industry, guidance bureaux, colleges and universities. The main emphasis is on counselling principles and techniques. Lectures are also given in individual assessment, occupational information, professional relations, and the counsellor and society. Again, practical work requirements must be fulfilled.

Lectures will be held in the evenings for 10-12 hours per week. Students wishing to qualify for an Honours degree are required to take an extra year’s study.

First Year
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.09 Mathematics for Psychology</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
</tr>
<tr>
<td>12.01 Psychology I</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>3 — 0</td>
</tr>
<tr>
<td>G13 English</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td>7 — 1</td>
<td>7 — 1</td>
<td>8 — 0</td>
</tr>
</tbody>
</table>

Second Year
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.21 General Biology (by special arrangement Physics I or advanced Mathematics may be substituted)</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
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<tr>
<td>12.02 Psychology II</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>2 — 2</td>
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<tr>
<td>G26 History</td>
<td>2 — 0</td>
<td>2 — 0</td>
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</tr>
<tr>
<td></td>
<td>6 — 6</td>
<td>6 — 6</td>
<td>6 — 6</td>
</tr>
</tbody>
</table>

245
### Third Year
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>l. lec. lab./tut.</td>
<td>3-1</td>
<td>3-1</td>
<td>3-1</td>
</tr>
<tr>
<td>12.03 Psychology III</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>12.10 Psychological Assessment I</td>
<td>2-0</td>
<td>2-0</td>
<td>2-0</td>
</tr>
<tr>
<td>C33 Philosophy</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>Organisation of Australian Industry</td>
<td>7-3</td>
<td>7-3</td>
<td>7-3</td>
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</tbody>
</table>

### Fourth Year
(34 weeks part-time course)

#### Industrial Course Elective

<table>
<thead>
<tr>
<th>Course</th>
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<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>l. lec. lab./tut.</td>
<td>3-0</td>
<td>3-0</td>
<td>3-0</td>
</tr>
<tr>
<td>12.20 Psychology IV (Social)</td>
<td>2-0</td>
<td>2-0</td>
<td>2-0</td>
</tr>
<tr>
<td>12.30 Industrial Psychology</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>12.11 Industrial and Labour Relations</td>
<td>3-0</td>
<td>3-0</td>
<td>3-0</td>
</tr>
<tr>
<td>12.70 Psychology IVb (Principles of Counselling)</td>
<td>6-4</td>
<td>6-4</td>
<td>6-4</td>
</tr>
</tbody>
</table>

#### Counselling Course Elective

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>l. lec. lab./tut.</td>
<td>3-0</td>
<td>3-0</td>
<td>3-0</td>
</tr>
<tr>
<td>12.20 Psychology IV (Social)</td>
<td>2-2</td>
<td>2-2</td>
<td>2-2</td>
</tr>
<tr>
<td>12.11a Psychological Assessment IIa (Counselling)</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
</tbody>
</table>

246
**FIFTH YEAR**

*(34 weeks part-time course)*

*Industrial Course Elective*

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td></td>
</tr>
<tr>
<td>12.21 Psychology V (Applied Social) ...</td>
<td>2 - 2</td>
<td>2 - 2</td>
<td>2 - 2</td>
</tr>
<tr>
<td>12.40 Personnel Techniques (including Field Work)</td>
<td>1 - 3</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td>12.50 Research Seminar</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td></td>
<td>4 - 5</td>
<td>4 - 5</td>
<td>4 - 5</td>
</tr>
</tbody>
</table>

*Counselling Course Elective*

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td></td>
</tr>
<tr>
<td>12.40A Psychology Vb (Counselling Techniques including Field Work)</td>
<td>2 - 4</td>
<td>2 - 4</td>
<td>2 - 4</td>
</tr>
<tr>
<td>12.43 Professional Relations</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>12.44 Occupational Information</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>12.50 Research Seminar</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td></td>
<td>5 - 4</td>
<td>5 - 4</td>
<td>5 - 4</td>
</tr>
</tbody>
</table>

**SIXTH YEAR (HONOURS)**

*(34 weeks part-time course)*

*Industrial or Counselling*

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td></td>
</tr>
<tr>
<td>12.31 Psychology VI—Current Issues in Applied Psychology</td>
<td>3 - 0</td>
<td>3 - 0</td>
<td>3 - 0</td>
</tr>
<tr>
<td>12.60 History of Psychology</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>12.51 Research Seminar</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td></td>
<td>5 - 0</td>
<td>5 - 0</td>
<td>5 - 0</td>
</tr>
</tbody>
</table>
Commerce (Applied Psychology)

The full-time and part-time courses leading to the degree of Bachelor of Commerce (Pass or Honours) with specialisation in applied psychology are designed to provide a specialist training in economics, together with a theoretical training in individual and group psychology and the skills and techniques used in applying psychology to personnel problems in industry, commerce and the public service. The first two special courses in psychology are aimed at giving the student a firm foundation of psychological theory, an appreciation of the application of scientific method to the social sciences, and some skill in psychological assessment and measurement techniques.

In the special subjects taken in the later years a detailed study will be made of personality development and group behaviour, particularly as they are related to personnel problems arising in the work situation. Industrial relations, personnel management, and the human relations problems of management and industrial conflict will be included in the more advanced stages of the course. Students will be encouraged to undertake field work, and each student will be expected to present a thesis describing an investigation carried out in a commercial or industrial setting.

COURSE XIIa—COMMERCE (APPLIED PSYCHOLOGY)

The full-time course extends over three years for the degree of Bachelor of Commerce (Pass), and over four years for Honours. Candidates for Honours will complete the first year of the Pass syllabus set out below, and in subsequent years will follow the programme detailed on pages 250 and 251.

First Year
(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1 (lec. tut.)</th>
<th>Term 2 (lec. tut.)</th>
<th>Term 3 (lec. tut.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.91</td>
<td>Psychology I (Com.)</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>14.11</td>
<td>Accounting I</td>
<td>2 - 2</td>
<td>2 - 2</td>
</tr>
<tr>
<td>15.11</td>
<td>Descriptive Economics</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>15.12</td>
<td>Economics I</td>
<td>1 1/2 - 1/2</td>
<td>1 1/2 - 1/2</td>
</tr>
<tr>
<td>G13</td>
<td>English</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>or G24</td>
<td>History</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>G30.1</td>
<td>Logic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10 1/2 - 2 1/2

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**SECOND YEAR**

*(34 weeks day course)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economics II</strong></td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td><strong>Economics III</strong></td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td><strong>Statistical Methods I</strong></td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td>Special Subject I</td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td>Special Subject II</td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2—0</td>
<td>2—0</td>
<td>2—0</td>
</tr>
</tbody>
</table>

**Total**                     | 9½—2½  | 9½—2½  | 9½—2½  

*Elective Subjects*

Students will choose as their Elective Subject one of the following:

- 12.92 Psychology II (Com.).
- 12.93 Psychology II (Education) — (for intending teachers).
- 14.52 Business Finance.
- 14.53A Production.
- 14.53B Marketing.
- Law.
- Science.
- Humanities Elective.
- Plus any course approved by the Faculty of Commerce.

**THIRD YEAR**

*(34 weeks day course)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accounting Control</strong></td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td><strong>Economics IV</strong></td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td><strong>Statistical Methods II</strong></td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>Seminar in Economic Problems</td>
<td>0—1</td>
<td>0—1</td>
<td>0—1</td>
</tr>
<tr>
<td>Special Subject III</td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td>Special Subject IV</td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td>Seminar in Specialisation</td>
<td>0—1</td>
<td>0—1</td>
<td>0—1</td>
</tr>
<tr>
<td><strong>Scientific Method</strong></td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
</tbody>
</table>

**Total**                     | 7½—3½  | 7½—3½  | 7½—3½  

*Note*—Short thesis on special subject to be submitted in this year.
HONOURS

Candidates for Honours will complete the first year of the full-time syllabus as set out above, and undertake the following programme in second, third and fourth years.

SECOND YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>Law I</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Business Finance</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Economics II</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Statistical Methods I</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Special Subject I</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
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<tr>
<td></td>
<td>9½ — 1½</td>
<td>9½ — 1½</td>
<td>9½ — 1½</td>
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</table>

THIRD YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>Accounting Control</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Law II</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Economics III</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Statistical Methods II</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Special Subject II</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Special Subject III</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td>9½ — 1½</td>
<td>9½ — 1½</td>
<td>9½ — 1½</td>
</tr>
</tbody>
</table>

*The two Elective subjects will be chosen from those listed on page 249, with the exception of 14.52 Business Finance.

Students may not take both 14.53A Production and 14.53B Marketing as electives.
FOURTH YEAR
(34 weeks day course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
</tbody>
</table>

14.53a Production ...........................................  
14.53b Marketing ...............................................  
15.15 Economics IV ...........................................  
Seminar in Economic Problems 0 — 1  
Special Subject IV 1⅓ — ¾  
Special Subject V 2 — 1  
Seminar in Special Subject 0 — 1  
430.2 Scientific Method ......................................  

8 — 4  

Note—Short thesis on special subject to be submitted in this year.

COURSE XIIb1—COMMERCE (APPLIED PSYCHOLOGY)

The part-time course extends over five years for the degree of Bachelor of Commerce (Pass), and over six years for Honours. Candidates for Honours will complete the first two years of the Pass syllabus set out below, and in subsequent years will follow the programme detailed on pages 253 and 254.

FIRST YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
</tbody>
</table>

14.11 Accounting I ...........................................  
15.11 Descriptive Economics  
G13 English ...............................................  
G24 History .................................................  
G30.1 Logic .................................................  

7 — 2  

251
### Second Year

**Year** (34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1 lec. tut.</th>
<th>Term 2 lec. tut.</th>
<th>Term 3 lec. tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.91 Psychology I (Com.)</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>15.12 Economics I</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>15.21 Statistical Methods I</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>G30.2 Scientific Method</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td></td>
<td>6 — 1</td>
<td>6 — 1</td>
<td>6 — 1</td>
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</table>

### Third Year

**Year** (34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
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<th>Term 2 lec. tut.</th>
<th>Term 3 lec. tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.15 Accounting Control</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>15.13 Economics II</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>15.22 Statistical Methods II</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Special Subject I</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td>7 — 1</td>
<td>7 — 1</td>
<td>7 — 1</td>
</tr>
</tbody>
</table>

* Students will choose one subject from the list of Electives set out on page 249.

### Fourth Year

**Year** (34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1 lec. tut.</th>
<th>Term 2 lec. tut.</th>
<th>Term 3 lec. tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.14 Economics III</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Special Subject II</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Special Subject III</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td></td>
<td>4½ — 1½</td>
<td>4½ — 1½</td>
<td>4½ — 1½</td>
</tr>
</tbody>
</table>

252
FIFTH YEAR  
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1 lec.</th>
<th>Term 2 lec.</th>
<th>Term 3 lec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 2</td>
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<td></td>
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<tr>
<td>Term 3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Term 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 15.15 Economics IV | 1½ | 1½ | 1½ |
| Seminar in Economic Problems | 0 | 0 | 0 |
| Special Subject IV | 1½ | 1½ | 1½ |
| Seminar in Special Subject | 0 | 0 | 0 |
| Total | 3 | 3 | 3 |

Note—Short thesis on special subject to be submitted in this year.

HONOURS

Candidates for Honours in the part-time course will complete the first two years of the pass syllabus set out above, and undertake the following programme in the third, fourth, fifth and sixth years.

THIRD YEAR  
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1 lec.</th>
<th>Term 2 lec.</th>
<th>Term 3 lec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 14.15 Accounting Control | 1 | 1 | 1 |
| 14.42 Law I | 1 | 1 | 1 |
| 14.43 Law II | 1 | 1 | 1 |
| 15.13 Economics II | 1½ | 1½ | 1½ |
| 15.22 Statistical Methods II | 1 | 1 | 1 |
| Elective Subject* | 2 | 2 | 2 |
| Total | 7½ | 7½ | 7½ |

* See footnote to Fourth Year.

FOURTH YEAR  
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1 lec.</th>
<th>Term 2 lec.</th>
<th>Term 3 lec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 14.53A Production | 2 | 2 | 2 |
| or 14.53B Marketing | 2 | 2 | 2 |
| 15.14 Economics III | 1½ | 1½ | 1½ |
| Special Subject I | 1½ | 1½ | 1½ |
| Elective Subject* | 2 | 2 | 2 |
| Total | 7 | 7 | 7 |

* Students will choose Elective subjects from those listed on page 249 with the exception of 14.52 Business Finance.
### Fifth Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
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<th>Term 3</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>14.52 Business Finance</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>15.15 Economics IV</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
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<tr>
<td>Special Subject II</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
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<tr>
<td>Special Subject III</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td></td>
<td>6½ — 1½</td>
<td>6½ — 1½</td>
<td>6½ — 1½</td>
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</tbody>
</table>

**Note:** Short thesis on special subject to be submitted in this year.

---

### Sixth Year

(34 weeks part-time course)

<table>
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<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>Seminar in Economic Problems</td>
<td>0 — 1</td>
<td>0 — 1</td>
<td>0 — 1</td>
</tr>
<tr>
<td>Special Subject IV</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
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<tr>
<td>Special Subject V</td>
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<td>2 — 1</td>
<td>2 — 1</td>
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<tr>
<td>Seminar in Specialisation</td>
<td>0 — 1</td>
<td>0 — 1</td>
<td>0 — 1</td>
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<tr>
<td></td>
<td>3½ — 3½</td>
<td>3½ — 3½</td>
<td>3½ — 3½</td>
</tr>
</tbody>
</table>

**Note:** Short thesis on special subject to be submitted in this year.
SCHOOL OF TEXTILE TECHNOLOGY

The field of textile technology is so broad in scope that students are given the opportunity of choosing from four courses, viz., Textile Chemistry, Textile Physics, Textile Engineering and Textile Manufacture. Each course extends over four years and leads to the degree of Bachelor of Science (Pass or Honours). The aim of all four courses is to produce graduates who have acquired a comprehensive knowledge of all the textile sciences and technologies, the courses themselves differing in the fundamental subjects offered in the second and third years. All students take a common first year (which is identical with that given in the Applied Chemistry, Chemical engineering, Food Technology, Metallurgy and Fuel Technology courses), and they need not choose the option they desire to follow until the end of that year. Students commence their six months practical training in industry in the long vacation at the end of the third year, and resume their academic work in the second term of fourth year, this year being common to the four Textile Technology courses.

Although Australia converts only 10 per cent of her wool clip and imports 90 per cent of her manufactured cotton and synthetic requirements, the textile industry is nevertheless the second largest manufacturing group in this country. Present-day textile technology is based on engineering and the fundamental sciences, and excellent opportunities await university trained scientists and technologists in the textile and allied industries, and in research and development organisations.

The conversion of textile raw materials into their finished products is simply a succession of, and an interaction between, a number of chemical, physical and engineering processes. Graduates with a good background in physics, chemistry or engineering, together with a broad training in the whole range of textile sciences and technologies, as provided in these courses, will substantially meet the present and future technological requirements of industry. They will also play a decisive part in bridging the gap which exists between fundamental research and its industrial application. The course in Textile Manufacture, which includes subjects in commerce and applied psychology, is especially designed to meet the undoubted need for executives in industry who have been given a comprehensive technological training.
## COURSE XIII—TEXTILE TECHNOLOGY

### First Year

*(34 weeks day course)*

Common to all four courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
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<td>3 — 3</td>
<td>3 — 3</td>
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<td>3 — 6</td>
<td>3 — 6</td>
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<td>5.211</td>
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<td>0 — 0</td>
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<td>4 — 2*</td>
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<tr>
<td>10.11b</td>
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<td>0 — 0</td>
<td>2 — 2*</td>
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<tr>
<td>G10</td>
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<td>2 — 0</td>
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<td>G20</td>
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</table>

| Total  | 15 — 11 | 14 — 14 | 10 — 14 |

* Tutorial

### TEXTILE CHEMISTRY

### Second Year

*(34 weeks day course)*

<table>
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<tr>
<th>Course</th>
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<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<td>2.32 Physical Chemistry</td>
<td>1 — 2 1</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>2.42 Inorganic Chemistry</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 2 1</td>
</tr>
<tr>
<td>2.52 Quantitative Analysis</td>
<td>1 — 2 1</td>
<td>1 — 2 1</td>
<td>1 — 2 1</td>
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<tr>
<td>2.62 Organic Chemistry</td>
<td>1 — 0</td>
<td>1 — 2 1</td>
<td>1 — 0</td>
</tr>
<tr>
<td>10.92 Statistics</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>0 — 0</td>
</tr>
<tr>
<td>13.12 Textile Technology I</td>
<td>7 — 5</td>
<td>4 — 5</td>
<td>8 — 8</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>0 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
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</tbody>
</table>

| Total                      | 13 — 11 | 12 — 11 | 14 — 13 |

### Third Year

*(34 weeks day course)*

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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</thead>
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<tr>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
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<td>2.33 Physical Chemistry</td>
<td>1 — 2</td>
<td>1 — 2 1</td>
<td>1 — 2 1</td>
</tr>
<tr>
<td>2.63 Organic Chemistry</td>
<td>1 — 2 1</td>
<td>1 — 2</td>
<td>1 — 2 1</td>
</tr>
<tr>
<td>13.13 Textile Technology II</td>
<td>7 — 8</td>
<td>7 — 8</td>
<td>7 — 9</td>
</tr>
<tr>
<td>13.23 Textile Science I</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
</tr>
<tr>
<td>13.33 Textile Engineering I</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>17.13 Biochemistry</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
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<td>Social Science Elective</td>
<td>2 — 0</td>
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</table>

| Total                      | 16 — 14 1 | 16 — 14 1 | 14 — 16 |
### TEXTILE PHYSICS

**SECOND YEAR**

(34 weeks day course)

<table>
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<th>Term 3</th>
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<tbody>
<tr>
<td>Physics II (Science)</td>
<td>4 - 4</td>
<td>4 - 4</td>
<td>4 - 1</td>
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<tr>
<td>Mathematics</td>
<td>3 - 2</td>
<td>3 - 2</td>
<td>3 - 2</td>
</tr>
<tr>
<td>Statistics</td>
<td>2 - 1</td>
<td>2 - 1</td>
<td>0 - 0</td>
</tr>
<tr>
<td>Textile Technology I</td>
<td>7 - 5</td>
<td>5 - 5</td>
<td>7 - 7</td>
</tr>
<tr>
<td>Philosophy</td>
<td>0 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td>16 - 12</td>
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<td>16 - 10</td>
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### THIRD YEAR

(34 weeks day course)

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<th>Term 3</th>
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<tr>
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<td>0 - 0</td>
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<tr>
<td>Textile Technology II</td>
<td>7 - 8</td>
<td>7 - 8</td>
<td>7 - 9</td>
</tr>
<tr>
<td>Textile Science</td>
<td>3 - 0</td>
<td>3 - 0</td>
<td>3 - 0</td>
</tr>
<tr>
<td>Textile Engineering I</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>0 - 0</td>
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<td></td>
<td>19 - 11</td>
<td>19 - 11</td>
<td>11 - 9</td>
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</table>

### TEXTILE ENGINEERING

**SECOND YEAR**

(34 weeks day course)

<table>
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<th>Term 3</th>
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<tbody>
<tr>
<td>Physics</td>
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<td>1 ¼ - 1 ½</td>
<td>1 ½ - 1 ½</td>
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<tr>
<td>Engineering Mechanics</td>
<td>1 - 1 ½</td>
<td>1 - 1 ½</td>
<td>0 - 0</td>
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<tr>
<td>Thermodynamics</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>0 - 0</td>
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<tr>
<td>Theory of Structures</td>
<td>1 - 1</td>
<td>1 - 1</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Properties of Materials</td>
<td>3 - 2*</td>
<td>3 - 2*</td>
<td>0 - 0</td>
</tr>
<tr>
<td>Mathematics</td>
<td>2 - 1</td>
<td>2 - 1</td>
<td>0 - 0</td>
</tr>
<tr>
<td>Textile Technology I</td>
<td>7 - 5</td>
<td>4 - 5</td>
<td>8 - 8</td>
</tr>
<tr>
<td>Philosophy</td>
<td>0 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td></td>
<td>16 ½-12 ½</td>
<td>15 ½-14</td>
<td>12 ½-11 ½</td>
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</table>

* Tutorial

* 54990—9    K 5137    257
### THIRD YEAR
(34 weeks day course)

<table>
<thead>
<tr>
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<th>Term 2</th>
<th>Term 3</th>
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<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<tr>
<td>5.12 Mechanical Engineering Design</td>
<td>0 — 3*</td>
<td>0 — 3*</td>
<td>0 — 0</td>
</tr>
<tr>
<td>5.33 Theory of Machines</td>
<td>1 — 1½</td>
<td>1 — 1½</td>
<td>0 — 0</td>
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<tr>
<td>6.83 Electrical Engineering</td>
<td>1 — 3.1*</td>
<td>1 — 3.1*</td>
<td>0 — 0</td>
</tr>
<tr>
<td>13.13 Textile Technology II</td>
<td>7 — 8</td>
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<td>7 — 9</td>
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<td>13.23 Textile Science I</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
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<tr>
<td>13.33 Textile Engineering I</td>
<td>1 — 0</td>
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<td>Social Science Elective</td>
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</table>

| Total                                 | 15 — 16½ | 15 — 16½ | 11 — 9  |

* Tutorial

### TEXTILE MANUFACTURE

### SECOND YEAR
(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
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<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
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<td>2 — 1</td>
<td>0 — 0</td>
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<tr>
<td>12.01 Psychology I</td>
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<tr>
<td>13.12 Textile Technology I</td>
<td>7 — 5</td>
<td>4 — 5</td>
<td>8 — 8</td>
</tr>
<tr>
<td>14.11 Accounting I</td>
<td>2 — 2*</td>
<td>2 — 2*</td>
<td>2 — 2*</td>
</tr>
<tr>
<td>15.12 Economics I</td>
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<td>2 — 0</td>
<td>2 — 0</td>
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<tr>
<td>G30 Philosophy</td>
<td>0 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

| Total                                 | 16 — 8  | 15 — 8  | 17 — 10 |

* Tutorial

### THIRD YEAR
(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
<td></td>
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<td>lec. lab./tut.</td>
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<td>12.02A Psychology II</td>
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<tr>
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<td>7 — 8</td>
<td>7 — 8</td>
<td>7 — 9</td>
</tr>
<tr>
<td>13.23 Textile Science I</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
</tr>
<tr>
<td>13.33 Textile Engineering I</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>14.52 Business Finance</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
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<tr>
<td>14.53B Marketing</td>
<td>2 — 0</td>
<td>2 — 0</td>
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</tbody>
</table>

| Total                                 | 17 — 8  | 17 — 8  | 17 — 9  |
FOURTH YEAR
(24 weeks day course.)
Common to all four courses
Second and third terms only—Long vacation and first term in industry

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>13.14 Textile Technology III</td>
<td>6 — 8</td>
<td>6 — 8</td>
</tr>
<tr>
<td>13.24 Textile Science II</td>
<td>4 — 0</td>
<td>4 — 0</td>
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<tr>
<td>13.34 Textile Engineering II</td>
<td>2 — 0</td>
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<td>Advanced Elective (Humanities or Social Science)</td>
<td>2 — 0</td>
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<tr>
<td>Research Project</td>
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<tr>
<td></td>
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SCHOOL OF ACCOUNTANCY

The School of Accountancy offers a full-time and a part-time course leading to the degree of Bachelor of Commerce. These courses, which may be taken at Pass or Honours standard, give a comprehensive and thorough training in accountancy built upon a foundation of general disciplines such as English, history, philosophy and psychology, and subjects such as economics and statistics which are essential to any proper study in the field of commerce. The study of these general subjects should enable students to see accountancy in proper social perspective.

In the specialist field of accountancy, the treatment of accounting and the associated subject of law is particularly comprehensive. Both the Pass and Honours curricula provide the student with an accountancy training more than sufficient to satisfy the existing requirements of professional bodies.

However, in view of the wide range of the accountant's responsibilities, these courses are designed to do more than provide a vocational training. Students are trained to think clearly and critically about accounting concepts and aims. To this end all students are encouraged to undertake original work as a basis for the thesis compulsorily prescribed in the final year, while Honours students must attend a seminar devoted to the discussion of advanced problems in accounting and a critical review of accounting aims and methods.

Within the field of accountancy, in accordance with the special concern of this University with the application of advanced knowledge to industrial and commercial activities, considerable emphasis is placed upon the problems and methods of management accounting. Thus Honours students, in addition to the studies in cost accounting which form part of the Pass course, follow an intensive course in advanced cost accounting during their final year of study. Moreover, the courses, Accounting Control and Statistical Methods II, have been carefully planned to complement each other and so should give all students a proper understanding of the way in which statistical and accounting techniques can be used together as control devices. By these means all students are provided with an insight into the role of accounting as a tool of management.

COURSE XIV—COMMERCE (ACCOUNTANCY)

The full-time course in Accountancy extends over three years for the degree of Bachelor of Commerce (Pass), and over four years for Honours. Students attempting Honours will complete the first year of the Pass syllabus set out below, and in subsequent years will follow the programme detailed on page 262.
### First Year

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Term 3</th>
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<td>15.11</td>
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<tr>
<td>15.12</td>
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<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
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<td>15.21</td>
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<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
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<td>History</td>
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**Hours per week:**
12 - 3

### Second Year

(34 weeks day course)

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<td>14.15</td>
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<td>1 - 0</td>
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<td>1 - 0</td>
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<tr>
<td>14.33</td>
<td>Taxation</td>
<td>2 - 0</td>
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<td>2 - 0</td>
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<td>14.41</td>
<td>Law I</td>
<td>1 - 0</td>
<td></td>
<td>1 - 0</td>
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<td>14.52</td>
<td>Business Finance</td>
<td>2 - 0</td>
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<td>15.13</td>
<td>Economics II</td>
<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
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<td>15.14</td>
<td>Economics III</td>
<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
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**Hours per week:**
12 - 3

### Third Year

(34 weeks day course)

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<tr>
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<td>2 - 2</td>
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<tr>
<td>14.23</td>
<td>Auditing</td>
<td>2 - 0</td>
<td></td>
<td>2 - 0</td>
</tr>
<tr>
<td>14.42</td>
<td>Law II</td>
<td>1 - 0</td>
<td></td>
<td>1 - 0</td>
</tr>
<tr>
<td>14.43A</td>
<td>Law III (Bankruptcy)†</td>
<td>2 - 0</td>
<td></td>
<td>2 - 0</td>
</tr>
<tr>
<td>14.43B</td>
<td>Law III (Company)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>G30.2</td>
<td>Scientific Method</td>
<td>1 - 0</td>
<td></td>
<td>1 - 0</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td></td>
<td>2 - 0</td>
<td></td>
<td>2 - 0</td>
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</table>

**Hours per week:**
12 - 3

† Bankruptcy Law, 1st term.

* Students will choose as their Elective Subject one of the following:

12.92 Psychology II (Com.)

14.53A Production

14.53B Marketing

15.15 Economics IV.

Plus any other course approved by the Faculty of Commerce.

**Note**—Short thesis on special subject to be submitted in this year.

261
Honours

Candidates for Honours will complete the first year of the Pass syllabus and undertake the following programme in second, third and fourth years.

**Second Year**

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>14.12 Accounting II</td>
<td>2</td>
<td>-2</td>
<td>2</td>
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<tr>
<td>14.15 Accounting Control</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>14.33 Taxation</td>
<td>2</td>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>14.41 Law I</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>15.13 Economics II</td>
<td>1½</td>
<td>1½</td>
<td>1½</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2</td>
<td>0</td>
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</tbody>
</table>

*Honours candidates will choose their Elective Subject from those listed above with the exception of 15.15 Economics IV.

**Third Year**

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tr>
<td></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>14.13 Accounting III</td>
<td>2</td>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>14.14 Accounting IV</td>
<td>2</td>
<td>-1</td>
<td>2</td>
</tr>
<tr>
<td>14.23 Auditing</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>14.42 Law II</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>14.43A Law III (Bankruptcy)†</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>14.43B Law III (Company)</td>
<td>1½</td>
<td>1½</td>
<td>1½</td>
</tr>
<tr>
<td>15.14 Economics III</td>
<td>1½</td>
<td>1½</td>
<td>1½</td>
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</tbody>
</table>

†Bankruptcy Law, 1st term.

**Fourth Year**

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
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<th>Term 3</th>
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<tr>
<td></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>14.16 Advanced Cost Accounting</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14.161 Seminar in Accounting</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>14.52 Business Finance</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>14.53A Production or Marketing</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>15.15 Economics IV</td>
<td>1½</td>
<td>½</td>
<td>1½</td>
</tr>
<tr>
<td>15.22 Statistical Methods II</td>
<td>1</td>
<td>0</td>
<td>1</td>
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<tr>
<td>G30.2 Scientific Method</td>
<td>1</td>
<td>0</td>
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</tbody>
</table>

Note—Short thesis on special subject to be submitted in this year.

262
COURSE XIVb—COMMERCE (ACCOUNTANCY)

The part-time course extends over five years for the degree of Bachelor of Commerce (Pass), and over six years for Honours. Candidates for Honours will complete the first three years of the Pass syllabus and in subsequent years will follow the programme set out on pages 264 and 265.

**FIRST YEAR**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course Code</th>
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<td>2 - 2</td>
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<td>Descriptive Economics</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
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<tr>
<td>G13</td>
<td>English</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
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<td>G24</td>
<td>History</td>
<td>1 - 0</td>
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**SECOND YEAR**

(34 weeks part-time course)

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<tr>
<td>14.12</td>
<td>Accounting II</td>
<td>2 - 2</td>
<td>2 - 2</td>
<td>2 - 2</td>
</tr>
<tr>
<td>14.41</td>
<td>Law I</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>15.12</td>
<td>Economics I</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>15.21</td>
<td>Statistical Methods I</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
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**THIRD YEAR**

(34 weeks part-time course)

<table>
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<td>2 - 2</td>
<td>2 - 2</td>
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<tr>
<td>14.42</td>
<td>Law II</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>14.43A</td>
<td>Law III (Bankruptcy)†</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>14.43B</td>
<td>Law III (Company)</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>15.13</td>
<td>Economics II</td>
<td>6½ - 2½</td>
<td>6½ - 2½</td>
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† Bankruptcy Law, 1st term.
FOURTH YEAR  
(34 weeks part-time course)  

<table>
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<td>2 - 0</td>
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<td>Accounting IV</td>
<td>2 - 1</td>
<td>2 - 1</td>
<td>2 - 1</td>
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<tr>
<td>Taxation</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Economics III</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
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<td></td>
<td>7½ - 1½</td>
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FIFTH YEAR  
(34 weeks part-time course)  

<table>
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<td>tut.</td>
<td>lec.</td>
</tr>
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<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Auditing</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Business Finance</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Statistical Methods II</td>
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<td>Scientific Method</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
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<td>9 - 0</td>
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* The list of Elective subjects is set out on page 261.

Note—Short thesis on special subject to be submitted in this year.

HONOURS

Candidates for Honours in the part-time course complete the first three years of the Pass syllabus and undertake the following programme in their fourth, fifth and sixth years.

FOURTH YEAR  
(34 weeks part-time course)  

<table>
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<td>2 - 1</td>
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<td>Auditing</td>
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<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Taxation</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
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<tr>
<td>Economics III</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td></td>
<td>7½ - 1½</td>
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### FIFTH YEAR

(34 weeks part-time course)

<table>
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<td>lec. tut.</td>
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<td>2 — 0</td>
<td>2 — 0</td>
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<td>14.15 Accounting Control</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>14.53A Production or Marketing</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>15.15 Economics IV</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>15.22 Statistical Methods II</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
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<tr>
<td><strong>Total</strong></td>
<td>7½ — ½</td>
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### SIXTH YEAR

(34 weeks part-time course)

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<td>lec. tut.</td>
<td>lec. tut.</td>
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<tr>
<td><strong>Term 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.16 Advanced Cost Accounting</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>2 — 1</td>
</tr>
<tr>
<td>14.161 Seminar in Accounting</td>
<td>0 — 1</td>
<td>0 — 1</td>
<td>0 — 1</td>
</tr>
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<td>14.52 Business Finance</td>
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</tr>
<tr>
<td>G30.2 Scientific Method</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7 — 2</td>
<td>7 — 2</td>
<td>7 — 2</td>
</tr>
</tbody>
</table>

*Honours candidates will choose their Elective subject from the list printed on page 281, with the exceptions of 15.15 Economics IV, and 14.53A Production or 14.53B Marketing (whichever subject was taken in fifth year).

**NOTE**—Short thesis on special subject to be submitted in this year.

### CONVERSION COURSE XIVc—ACCOUNTANCY

Holders of a diploma in Accountancy from the Sydney Technical College are required to complete the following additional subjects in order to qualify for the degree of Bachelor of Commerce.

### FIRST YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td><strong>Term 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.13 Economics II</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>15.14 Economics III</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>15.21 Statistical Methods I</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>G13 English or History</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G24 History</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7½ — ½</td>
<td>7½ — ½</td>
<td>7½ — ½</td>
</tr>
</tbody>
</table>
SECOND YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>14.15 Accounting Control</td>
<td>1 – 0</td>
<td></td>
<td>1 – 0</td>
</tr>
<tr>
<td>14.161 Accounting Seminar</td>
<td>0 – 1</td>
<td></td>
<td>0 – 1</td>
</tr>
<tr>
<td>14.52 Business Finance</td>
<td>2 – 0</td>
<td></td>
<td>2 – 0</td>
</tr>
<tr>
<td>G30.2 Scientific Method</td>
<td>1 – 0</td>
<td></td>
<td>1 – 0</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2 – 0</td>
<td></td>
<td>2 – 0</td>
</tr>
</tbody>
</table>

* Conversion students will choose as their Elective Subject one of the following:—

- 12.91 Psychology I (Com.)
- 14.53a Production
- 14.53b Marketing
- 15.15 Economics IV

Science
Humanities Elective

Plus any course approved by the Faculty of Commerce.

Note—Short thesis on special subject to be submitted in this year.
The School of Economics offers full-time and part-time courses which allow for specialisation in economics or statistics or industrial relations and lead to the degree of Bachelor of Commerce. The full-time courses extend over three years for a Pass degree and four years for Honours, and the part-time courses extend over five years for a Pass degree and six years for Honours. Students will elect to major in their special field at the end of their first year and will select their special subjects in one of these fields in consultation with the Head of the School of Economics.

Economics

Students who specialise in economics will help to meet the demand for persons trained in the methods of economic analysis. This demand is growing not merely because it is realised that the study of economics gives an understanding of the workings of modern society and develops the habit of rigorous analysis, though both these consequences are of considerable educational value, but largely because, in recent years, not only the public service but also commercial, financial and industrial concerns have found it much to their benefit to employ economists in a professional capacity and to encourage their promising young executives to acquire a training in the methods of economic analysis. In this course the study of economics is based upon a firm foundation of economic theory which is built up partly in those economics courses which are taken by all students reading for the degree of Bachelor of Commerce, and partly in the additional specialist courses.

The application of advanced knowledge in the fields of industry and commerce is a special concern of the University. In accordance with this, particular emphasis in the teaching of economics is placed upon the application of the principles of economic analysis to problems of policy—both public and private. Students are encouraged to undertake original investigations as a basis for their compulsory thesis, and they are required to attend and participate in a seminar in contemporary economic problems. In this way the student acquires an understanding of the methods and limitations of applied economics and receives training in employing the tools of analysis developed by the economic theory.

Statistics

Students who elect to major in statistics will find that the work of the economic statistician is complementary to that of the theoretical and applied economist, and that it is of direct use to the public service and to financial, commercial, and industrial enterprises. In consequence the demand for properly trained economic statis-
ticians is increasing more rapidly than the supply. The purpose of
the course providing for specialisation in statistics is to train
graduates capable of meeting this demand.

The specialised training in statistics is based on a study of mathe-
matics and gives an intensive training in the logical bases of ad-
vanced statistical analysis. In developing this statistical training con-
siderable emphasis is placed upon the actual application of advanced
techniques to economic, industrial and commercial problems. All
students are required to submit a short thesis upon a subject either
involving statistical enquiry or dealing with the methods of statisti-
cal analysis and to attend a seminar in statistical problems. By
these means students are given a thorough training not only in the
logic of advanced statistical methods but in their application to
the types of problem encountered in the public service, industry and
commerce.

Industrial Relations

The term “industrial relations” covers a wide and important
field of study which is becoming increasingly specialised in character.
From the point of view of commerce, industry, and labour organiza-
tions there is a growing need for persons who have not only received
a good general education including a thorough training in economics
and statistics but who are also familiar with the legal and psycho-
logical aspects of industrial relations. The purpose of the course
leading to the degree of Bachelor of Commerce with specialization in
industrial relations is to provide a training of this type. For details
of the course see page 275 below.

General

The general pattern of the course is the same for all specialisa-
tions. All students take courses in philosophy, psychology and
history or English, as well as the more specifically commercial sub-
jects of economics and accounting. There are also two courses in
statistical methods which form part of all commerce courses.

The special subjects must be chosen from a list offered by the
School of Economics, and though as much latitude as possible will
be given to students in making their choice, the subjects chosen
must be approved by the Head of the School.

At present, the range of approved special courses in Economics
from which a student may make his selection is as follows:

Special Subject I: G55 Government or Constitutional Law or
Commercial Law or Economic History.

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Special Subject II: Public Finance or Financial Institutions and Policy.


Students specializing in statistics will take courses in mathematics as Special Subjects I and II, and in advanced economic statistics as Special Subjects III and IV.

COURSE XV—COMMERCE (ECONOMICS) AND COURSE XV A—COMMERCE (STATISTICS)

The full-time course extends over three years for the degree of Bachelor of Commerce (Pass), and over four years for Honours. Candidates for Honours will complete the first year of the Pass syllabus set out below, and in subsequent years will follow the programme detailed on page 271.

FIRST YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Term</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
<td>tut.</td>
</tr>
<tr>
<td>12.91</td>
<td>Psychology I (Com.)</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>14.11</td>
<td>Accounting I</td>
<td>2 — 2</td>
<td>2 — 2</td>
</tr>
<tr>
<td>15.11</td>
<td>Descriptive Economics</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>13.12</td>
<td>Economics I</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>G13</td>
<td>English or</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G24</td>
<td>History</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>G30.1</td>
<td>Logic</td>
<td>10½ — 2½</td>
<td>10½ — 2½</td>
</tr>
</tbody>
</table>

269
### SECOND YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>15.13 Economics II</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>15.14 Economics III</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>15.21 Statistical Methods I</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>Special Subject I†</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>Special Subject II†</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>9½ — 2½</td>
<td>9½ — 2½</td>
<td>9½ — 2½</td>
</tr>
</tbody>
</table>

† Economics students who intend to enter the teaching profession may take Geography I and II (if available).

* Elective Subjects.

Students will choose as their Elective Subject one of the following:

- 12.92 Psychology II (Com.)
- 12.93 Psychology II (Education) (for intending teachers).
- 14.52 Business Finance.
- 14.53A Production.
- 14.53B Marketing.
- Science.
- Humanities Elective.
- Law.
- Plus any course approved by the Faculty of Commerce.

### THIRD YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>14.15 Accounting Control</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>15.15 Economics IV</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>15.22 Statistical Methods II</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Seminar in Economic Problems</td>
<td>0 — 1</td>
<td>0 — 1</td>
<td>0 — 1</td>
</tr>
<tr>
<td>Special Subject III</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>Special Subject IV</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>Seminar in Specialisation</td>
<td>0 — 1</td>
<td>0 — 1</td>
<td>0 — 1</td>
</tr>
<tr>
<td>G30.2 Scientific Method</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7½ — 3½</td>
<td>7½ — 3½</td>
<td>7½ — 3½</td>
</tr>
</tbody>
</table>

**NOTE**—Short thesis on special subject to be submitted in this year.

### HONOURS

Candidates for Honours will complete the first year of the full-time syllabus as set out above, and undertake the following programme in second, third and fourth years.
SECOND YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>14.41 Law I</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>14.52 Business Finance</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>15.13 Economics II</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>15.21 Statistical Methods I</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>Special Subject I †</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
</tbody>
</table>

Hours per week

9½ - 1½ | 9½ - 1½ | 9½ - 1½ |

THIRD YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>14.15 Accounting Control</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>14.42 Law II</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>15.14 Economics III</td>
<td>1¼ - ¼</td>
<td>1¼ - ¼</td>
<td>1¼ - ¼</td>
</tr>
<tr>
<td>15.22 Statistical Methods II</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Special Subject II †</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>Special Subject III</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
</tbody>
</table>

Hours per week

9½ - 1½ | 9½ - 1½ | 9½ - 1½ |

† Economics students who intend to enter the teaching profession may take Geography I and II (if available).

* The two Elective Subjects will be chosen from those listed on page 270, with the exception of 14.52 Business Finance. Students may not take both 14.53 A Production and 14.53 B Marketing.

FOURTH YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>14.53A Production</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>14.53B Marketing</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>15.15 Economics IV</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>Seminar in Economic Problems</td>
<td>0 - 1</td>
<td>0 - 1</td>
<td>0 - 1</td>
</tr>
<tr>
<td>Special Subject IV</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>Special Subject V</td>
<td>2 - 1</td>
<td>2 - 1</td>
<td>2 - 1</td>
</tr>
<tr>
<td>Seminar in Special Subject</td>
<td>0 - 1</td>
<td>0 - 1</td>
<td>0 - 1</td>
</tr>
<tr>
<td>G30.2 Scientific Method</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
</tbody>
</table>

Hours per week

8 - 4 | 8 - 4 | 8 - 4 |

Note—Short thesis on special subject to be submitted in this year.
The part-time course extends over five years for the degree of Bachelor of Commerce (Pass), and over six years for Honours. Candidates for Honours will complete the first two years of the Pass syllabus set out below, and in subsequent years will follow the programme detailed on pages 273 and 274.

**First Year**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>14.11 Accounting I</td>
<td>2 - 2</td>
<td>2 - 2</td>
</tr>
<tr>
<td>15.11 Descriptive Economics</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>G13 English</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>or G24 History</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>7 - 2</td>
<td>7 - 2</td>
</tr>
</tbody>
</table>

**Second Year**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>12.91 Psychology I (Com.)</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>15.12 Economics I</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>15.21 Statistical Methods I</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>G30.2 Scientific Method</td>
<td>6 - 1</td>
<td>6 - 1</td>
</tr>
</tbody>
</table>

**Third Year**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
</tr>
<tr>
<td>14.15 Accounting Control</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>15.13 Economics II</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>15.22 Statistical Methods II</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Special Subject †</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>7 - 1</td>
<td>7 - 1</td>
</tr>
</tbody>
</table>

* Students will choose one subject from the list of Electives set out on page 270.
† See footnote to Fourth Year.
FOURTH YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>15.14</td>
<td>Economics III</td>
<td>1½</td>
</tr>
<tr>
<td>Special Subject II†</td>
<td>1½</td>
<td>½</td>
</tr>
<tr>
<td>Special Subject III</td>
<td>1½</td>
<td>½</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4½</td>
</tr>
</tbody>
</table>

† Economics students who intend to enter the teaching profession may take Geography I and II (if available).

FIFTH YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>15.15</td>
<td>Economics IV</td>
<td>1½</td>
</tr>
<tr>
<td>Seminar in Economic Problems</td>
<td>0</td>
<td>—</td>
</tr>
<tr>
<td>Special Subject IV</td>
<td>1½</td>
<td>½</td>
</tr>
<tr>
<td>Seminar in Special Subject</td>
<td>0</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Note—Short thesis on special subject to be submitted in this year.

HONOURS

Candidates for Honours in the part-time course will complete the first two years of the Pass syllabus set out above, and undertake the following programme in the third, fourth, fifth and sixth years.

THIRD YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>14.15</td>
<td>Accounting Control</td>
<td>1</td>
</tr>
<tr>
<td>14.41</td>
<td>Law I</td>
<td>1</td>
</tr>
<tr>
<td>14.42</td>
<td>Law II</td>
<td>1</td>
</tr>
<tr>
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* See footnote to Fourth Year.
### FOURTH YEAR

(34 weeks part-time course)

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<th>Term 2 tut.</th>
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<th>Term 3 tut.</th>
</tr>
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* Students will choose two Elective subjects from those listed on page 270, with the exception of 14.52 Business Finance.

### FIFTH YEAR

(34 weeks part-time course)

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† Economics students who intend to enter the teaching profession may take Geography 1 and 11 (if available).

### SIXTH YEAR

(34 weeks part-time course)

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<th>Term 2 tut.</th>
<th>Term 3 lec.</th>
<th>Term 3 tut.</th>
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<td>½</td>
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<td>1</td>
<td>0</td>
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**NOTE**—Short thesis on special subject to be submitted in this year.
COURSE XVIA—COMMERCe (INdUSTRIAL RELATIons)

**FIRST YEAR**

(34 weeks day course)

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<th>Term 3</th>
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|                | lec.  | tut.   | lec.  | tut.   |
| 12—3 | 12—3 | 12—3 |

**SECOND YEAR**

(34 weeks day course)

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|                | lec.  | tut.   |
| 13—1 | 13—1 | 13—1 |
### Third Year

*(34 weeks day course)*

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**Note**—Short thesis on special subject to be submitted in this year.

### Honours

Candidates for Honours will complete the first year of the full-time syllabus set out above, and undertake the following programme in second, third and fourth years.

### Second Year

*(34 weeks day course)*

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### THIRD YEAR
(34 weeks day course)

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<td>1½ — ½</td>
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* One from a range of subjects offered in Psychology or Economics.

### FOURTH YEAR
(34 weeks day course)

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<td>4 — 0</td>
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<td>Scientific Method</td>
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Note—Short thesis on special subject to be submitted in this year.
The part-time course extends over five years for the degree of Bachelor of Commerce (Pass) and over six years for Honours.

**FIRST YEAR**

(34 weeks part-time course)

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<td>G30.1 Logic</td>
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**SECOND YEAR**

(34 weeks part-time course)

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<td>1½ - ½</td>
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<td>15.21 Statistical Methods I</td>
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<td>1½ - ½</td>
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### Third Year

(34 weeks part-time course)

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<td>1½ - ½</td>
<td>1½ - ½</td>
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<tr>
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<td>1 - 0</td>
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<tr>
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*7½ - ½ 7½ - ½ 7½ - ½*

### Fourth Year

(34 weeks part-time course)

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<td>15.34</td>
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*7½ - ½ 7½ - ½ 7½ - ½*

### Fifth Year

(34 weeks part-time course)

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*7½ - ½ 7½ - ½ 7½ - ½*

**Note**—Short thesis on special subject to be submitted in this year.
Honours

Candidates for Honours in the part-time course will complete the first four years of the Pass syllabus, as set out above, and undertake the following programme in the fifth and sixth years.

Fifth Year
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>12.95</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Psychology IV A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.15</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Economics IV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.34</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Law D, Part II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 2</td>
</tr>
</tbody>
</table>

* One from a range of subjects offered in Psychology or Economics.

Sixth Year
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>Special Problems in Industrial Relations</td>
<td>3 — 0</td>
<td>3 — 0</td>
<td>3 — 0</td>
</tr>
<tr>
<td>Government</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Seminar in Industrial Relations</td>
<td>0 — 2</td>
<td>0 — 2</td>
<td>0 — 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>Special Problems in Industrial Relations</td>
<td>5 — 2</td>
<td>5 — 2</td>
<td>5 — 2</td>
</tr>
</tbody>
</table>

Note—Short thesis on special subject to be submitted in this year.

280
The establishment of the Foundation Chair in Hospital Administration was made possible by a generous grant from the W. K. Kellogg Foundation, Battle Creek, Michigan, U.S.A.

The continual expansion of the basic functions and services of the modern hospital have transformed it in a short period of time from a relatively simple structure to a highly complex organisation. Every advance in medical science has added to the complexity of function in all departments of the hospital, and this changing and intricate pattern has turned its financial transactions into a major accounting process.

The administrative activities of the hospital of yesterday were largely confined to a few internal operations dealing with nursing care, food service and simple supply needs. Today with the large increase in the personnel needed to staff the hospital and in the degrees of skill required by them, the resulting problems of human relations call for the skilful techniques of good management.

The courses given by the School of Hospital Administration are designed to provide the knowledge and develop the skills necessary for effectively dealing with these intricate administrative and personnel problems which face the executive of the modern hospital.

The School offers two courses, Course XVI, a three year course leading to the degree of Master of Hospital Administration, and Course XVIa, an extension course of one year’s duration.

COURSE XVI—HOSPITAL ADMINISTRATION

Course XVI is of three years’ duration and leads to the degree of Master of Hospital Administration. For the conditions governing entry to the course, see pages 130 and 131.

The first year requires full-time attendance at the University and consists mainly of lectures, seminars and visits to hospitals, clinics, etc.

During the second and third years the student will carry out supervised work in hospitals to gain experience and practical training in hospital administration.
FIRST YEAR
(34 weeks day course)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.94</td>
<td>Applied Psychology</td>
<td></td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>14.11B</td>
<td>Accounting</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>15.111</td>
<td>Economics</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>16.1</td>
<td>Theory of Management</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>16.3</td>
<td>Fundamentals of Medical Science</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>16.4</td>
<td>Fundamentals of the Hospital in Operation</td>
<td></td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>16.6</td>
<td>Hospital Organisation</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>16.7</td>
<td>Advanced Hospital Administration</td>
<td></td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>16.8</td>
<td>Biostatistics</td>
<td></td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>16.9</td>
<td>Public Health Administration</td>
<td></td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td>23</td>
<td>23</td>
</tr>
</tbody>
</table>

SECOND YEAR
12 months Administrative Residency

Students will be required to spend the full calendar year in one or more hospitals under the supervision and guidance of selected administrators to gain experience and practical training.

THIRD YEAR
12 months Administrative Assistantship

The third year will consist of twelve months administrative assistantship in a selected hospital. This administrative-in-service training will provide the student with further experience and practical training. During this period a thesis is to be prepared embodying the results of an original investigation.

COURSE XVIa—EXTENSION COURSE IN HOSPITAL ADMINISTRATION

The full-time extension course is a day course of one calendar year and aims to give a short systematic training to those who have an adequate background of general education and hospital experience, and who are either not qualified academically or unable for other reasons to take the Master's course.

In addition to the lectures and seminars students will visit hospital departments, clinics and special hospitals and diagnostic units to gain a comprehensive background to the academic instruction.
Applicants seeking to enrol in the extension course are required to fulfil the following conditions, although, if in the opinion of the Professorial Board any applicant not meeting these requirements possesses sufficient general qualifications and intellectual attainments, he may be admitted to the course.

(a) Applications to enrol in the extension course in Hospital Administration shall be made on the prescribed form which shall be lodged with the Registrar of the University at least two full calendar months before the commencement of the first term.

(b) Candidates shall be at least 25 years of age and shall have attained Leaving Certificate standard of education.

(c) Candidates shall have had at least three years experience in the field of hospital service and be currently employed in an executive capacity in a hospital.

(d) Candidates shall have had satisfactory instruction and experience in elementary accounting.

The purpose of the course is to supplement and systematise the student's previous hospital experience and knowledge. On completion of the course the University will award a certificate to successful students.

(46 weeks day course)

<table>
<thead>
<tr>
<th></th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Term 1</td>
</tr>
<tr>
<td>†12.94 Applied Psychology</td>
<td></td>
</tr>
<tr>
<td>†14.11 Accounting</td>
<td>4</td>
</tr>
<tr>
<td>16.2 Hospital Planning, Construction and Design</td>
<td>2</td>
</tr>
<tr>
<td>16.3 Fundamentals of Medical Science</td>
<td>2</td>
</tr>
<tr>
<td>16.4 Fundamentals of the Hospital in Operation</td>
<td>6*</td>
</tr>
<tr>
<td>†16.5 Theory of Management</td>
<td>2</td>
</tr>
<tr>
<td>16.6 Hospital Organisation</td>
<td>0</td>
</tr>
<tr>
<td>16.9 Public Health Administration</td>
<td></td>
</tr>
</tbody>
</table>

* Includes practical work, field trips to hospitals, clinics, etc.
† These subjects will be studied for 34 weeks only.
The impact of the biological sciences on the community is extremely widespread, ranging from agriculture and public health to food processing and the preservation of structural materials. Wherever the care and culture of living organisms or the manipulation and processing of material of biological origin is involved, there is likely to be a need for graduates trained in one or more of the biological sciences. The teaching and research activities of the School include the primary biological sciences, botany, zoology and microbiology, which respectively embrace the study of plants, animals and microorganisms, and certain of the important sub-divisions of these sciences, such as bacteriology and entomology. The two related sciences, physiology and biochemistry, interpenetrate the primary biological sciences and the latter in particular provides the principal link between these fields of study and the physical sciences. Physiology is concerned with the study of function while biochemistry has as its primary objectives the chemical aspects of structure and the explanation of biological events in physico-chemical terms.

Some of the biological technologies are long established and excellent facilities exist for training in such fields as medicine, veterinary science and agriculture. The past few decades have seen spectacular advances in the fermentation industries, in food preservation and processing, in the control of insect and microbial pests, and in the more rational control of traditional processes involving biological materials. These trends have emphasised the need for suitably qualified personnel and for the provision of professional training courses giving a sound foundation in the physical sciences and general biology, and providing for specialisation in the various branches of biological science. The part-time degree course in Applied Biology has been specifically designed to meet such training requirements.

Facilities for general training in biological science to degree level without specialisation for the needs of industry are also provided. Major sequences, to Honours standard, are offered in botany, zoology, biochemistry and microbiology in the full-time and part-time Science courses, details of which are set out on pages 304 to 310.

Further a basic course in biology is available to graduates in other sciences or in engineering who require to extend the scope of their professional training to include the biological sciences.

**COURSE XVIIb—APPLIED BIOLOGY**

The part-time degree course in Applied Biology offers majors in biochemistry, entomology and microbiology, or combinations of these with chemistry, and specialisation follows from a common foundation
of mathematics, physics, chemistry and general biology. The course extends over six part-time years for the degree of Bachelor of Science (Pass), and over seven part-time years for an Honours degree. Students are required to be employed in an occupation involving some aspect of the application of biological science to industry.

First Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.11 Physics, Part I</td>
<td>$1\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>10.11B Mathematics, Part I</td>
<td>2</td>
<td>1*</td>
<td>2</td>
</tr>
</tbody>
</table>

$5\frac{1}{2}$ — 6

* Tutorial

Second Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.11 Physics, Part II</td>
<td>$1\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part II</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>17.21 General Biology</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

$4\frac{1}{2}$ — 7

Third Year

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.32d Physical Chemistry</td>
<td>1</td>
<td>2 $\frac{1}{2}$</td>
<td>1</td>
</tr>
<tr>
<td>2.62 Organic Chemistry</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Plus TWO electives from—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.52 Quantitative Analysis</td>
<td>1</td>
<td>2 $\frac{1}{2}$</td>
<td>1</td>
</tr>
<tr>
<td>2.42 Inorganic Chemistry</td>
<td>1</td>
<td>2 $\frac{1}{2}$</td>
<td>1</td>
</tr>
<tr>
<td>17.31 Botany</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>17.71 Zoology</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

$4$ — 6 $\frac{1}{2}$ — 7 $\frac{1}{2}$

Students majoring in Entomology must take 17.31 Botany and 17.71 Zoology as electives.
**FOURTH YEAR**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry</td>
<td>17.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plus THREE electives from—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Chemistry</td>
<td>2.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>2.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Biology</td>
<td>17.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entomology</td>
<td>17.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microbiology</td>
<td>17.51</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total                          |    4 — 8-8 |    4 — 8-8 |    4 — 8-9 |

Elective subjects must be chosen with due regard to pre-requisites. Students majoring in Entomology must include Experimental Biology as an elective.

**FIFTH YEAR**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry</td>
<td>17.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entomology and Entomology</td>
<td>17.42</td>
<td>17.43</td>
<td></td>
</tr>
<tr>
<td>Microbiology and Microbiology</td>
<td>17.52</td>
<td>17.53</td>
<td></td>
</tr>
</tbody>
</table>

| Total                          |    4 — 8 |    4 — 8 |    4 — 8 |

*EITHER—any two major sequences from—*

<table>
<thead>
<tr>
<th>Subject</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Chemistry</td>
<td>2.34d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>2.64d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Organic Chemistry</td>
<td>2.65b</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Chemistry and Analysis of Food |        |        |        |

| Total                          |    4 — 8-10 |    4 — 8-10 |    4 — 8-10 |

*OR—one major sequence (from above) plus two electives from—*

<table>
<thead>
<tr>
<th>Subject</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entomology</td>
<td>17.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microbiology</td>
<td>17.52</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total                          |    4 — 8-10 |    4 — 8-10 |    4 — 8-10 |

**SIXTH YEAR**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>English or G23 History</td>
<td>G13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logic</td>
<td>G30.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economics or G63 Psychology or</td>
<td>G43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G83 Sociology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>G50.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total                          |    6 — 0 |    6 — 0 |    6 — 0 |
ADDITIONAL FOR HONOURS

Students desiring to take Honours must apply to the Head of the School of Biological Sciences not later than the 31st December in the year in which the fifth year is completed. The programme of study can be taken over two part-time years or one full-time year, and will be made up as follows (for two part-time years):

<table>
<thead>
<tr>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities .............. 3</td>
</tr>
<tr>
<td>Advanced formal instruction in the field of study .... 3</td>
</tr>
<tr>
<td>Research project ........... 7</td>
</tr>
</tbody>
</table>

13

Advanced formal study and a research project can only be undertaken in the subject(s) in which the student has majored. The three fields in which Honours may be taken are:

Biochemistry, Entomology, Microbiology.

A thesis embodying the results of the research project must be submitted.

COURSE XVIIG—BASIC BIOLOGY COURSE FOR SCIENCE GRADUATES

A short course designed to provide basic instruction in biological science is offered to graduates and diplomates in science and to other persons with approved scientific training. While primarily designed to broaden scientific background, the needs of science teachers have been kept especially in mind in framing this course which, it is hoped, will make some contribution towards alleviating the shortage of science teachers with biological training.

The course may be taken in two years or more of part-time study. Students completing the course in two years will undertake the following programme of study.

FIRST YEAR
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>17.13 Biochemistry ........................................ 1 — 2</td>
</tr>
<tr>
<td>17.21 General Biology ........................................ 2 — 4</td>
</tr>
</tbody>
</table>

3 — 6
**SECOND YEAR**

*(34 weeks part-time course)*

Students will take three subjects from the following list, one of which must be either 17.31 Botany or 17.71 Zoology.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours per week for 34 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.23 Experimental Biology</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.31 Botany</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.41 Entomology I</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.51 Microbiology</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.71 Zoology</td>
<td>1 — 2</td>
</tr>
</tbody>
</table>

---

3 — 6

---

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The Department of Production Engineering offers a full-time and a part-time course in industrial engineering leading to the degree of Bachelor of Engineering. These courses are designed for persons with engineering ability whose interests lie in the planning, developing and control of manufacturing operations.

The first two years of the full-time course and the first four years of the part-time course provide the student with a sound foundation in the basic science and engineering subjects, and this knowledge is used and extended in the later years in the study of the industrial subjects. Finally, the problems associated with the practical economics of manufacturing operations are studied. These three fields of study provide the student with the training necessary to carry out an industrial job and to examine it critically in the light of economic efficiency.

Traditional engineering courses do not embrace the problems which are characteristic of industrial engineering. These problems include the analyses of a product with regard to methods and sequence of manufacturing operations; the disposition of buildings and of equipment in relation to buildings to permit efficient handling of materials; the avoidance or elimination of bottlenecks; the related problems of quality and cost control, testing and inspection; labour and personnel relations; and finally, the problem of distribution and sales.

The financial and economic aspects are emphasized as the problem in manufacturing has not been solved until the final translation of the product into money has been accomplished successfully. While it is not intended to develop an expert in accounting practice or economics it is intended to produce an engineer with an appreciation of the problems of cost and one who can apply considerations of ultimate economy to all industrial problems.

The first three years of the full-time course require attendance at the University for twenty-four weeks. For the remainder of each of these years the student gains practical experience in industry. The fourth year requires full-time attendance for thirty-four weeks. The part-time course extends over seven years.
# COURSE XVIII—INDUSTRIAL ENGINEERING

## First Year
(24 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
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* Tutorial

## Second Year
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<td>1 4/1—1*</td>
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<td>1—1—1*</td>
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## Third Year
(24 weeks day course)

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<td>18.33 Methods Engineering</td>
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* Tutorial

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### FOURTH YEAR

**34 weeks day course**

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* Tutorial

### COURSE XVIIIb—INDUSTRIAL ENGINEERING

**FIRST YEAR**

**34 weeks part-time course**

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† 1st Half-year—Descriptive Geometry

2nd Half-year—Engineering Drawing

* Tutorial

### SECOND YEAR

**34 weeks part-time course**

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* Tutorial

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### Third Year
(34 weeks part-time course)

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<td>6.83D Electrical Engineering</td>
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<td>10.12 Mathematics, Part I</td>
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<td>G20 History</td>
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* Tutorial

### Fourth Year
(34 weeks part-time course)

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<td>5.52D Fluid Mechanics</td>
<td>Term 3: 1 - 1*</td>
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<td>18.12 Industrial Administration</td>
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<td>G30 Philosophy</td>
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* Tutorial

### Fifth Year
(34 weeks part-time course)

<table>
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<td>12.012 Psychology</td>
<td>Term 2: 2 - 0</td>
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<tr>
<td>14.11A Accounting</td>
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### Notes

- Term 1: 1 - 0
- Term 2: 1 - 0
- Term 3: 1 - 0
### SIXTH YEAR

(34 weeks part-time course)

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<tr>
<td>18.64 Industrial and Commercial Law</td>
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<td>1½ — 1</td>
<td>1½ — 1</td>
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<td>18.94 Marketing</td>
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### SEVENTH YEAR

(34 weeks part-time course)

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</table>
The establishment of the School of Traffic Engineering followed the endowment of a Chair by the Australian Automobile Association which had long been concerned with the need for a centre for training traffic engineers and specialists. The School is assisting this object by conducting courses in traffic and transport planning and control and offering opportunities for research into the technical problems created by the tremendous growth in the use of the motor vehicle on the street and highway system and also on its impact on other forms of transport and business and social activity.

The initial activities of the School are being concentrated in the main at the postgraduate level and include—

(a) A special graduate level course in Traffic Planning and Control of one term full-time study or three terms part-time study;
(b) A course of one full academic year leading to the degree of Master of Technology in traffic engineering;
(c) Postgraduate studies leading to higher degrees in the various disciplines associated with transport and traffic problems.

Traffic engineering has strong links with highway engineering, particularly in relation to the geometric design and location of highway systems. However, the current developments in traffic engineering are directed more towards the overall study of transport planning and control. In this regard, the courses at the University are embracing the new philosophy and methods of operations research. As a result of this, strong emphasis is being placed on mathematics and statistics with the object of developing theoretical models of traffic phenomena and providing a sound basis for the collection and analysis of traffic data. The main topics in all the courses to be offered are—

(a) Statistics.
(b) Theory of Traffic Behaviour.
(c) Applications and Practice of Traffic Engineering.
(d) Operational Analysis of Highway and Other Traffic Systems.
(e) Highway Design Principles.
(f) Fundamentals of City and Regional Planning.

Much of the work of the students in these various courses will be done in the field. In this regard, the School is most fortunate, situated as it is in a vast metropolitan area with a high traffic density. In addition, the city possesses major rail, sea and air terminal
facilities as well as an extensive public transport system. The City of Sydney does, in fact, provide a ready-made and extensive laboratory in which to conduct advanced studies covering the whole field of transportation.

**COURSE XIXG1—MASTER OF TECHNOLOGY (TRAFFIC ENGINEERING)**

A full-time course of one academic year leading to the degree of Master of Technology is offered by the School of Traffic Engineering. The course is available to Honours graduates in Civil, Electrical and Mechanical Engineering, Science and to such other graduates as may be admitted with the approval of the Head of the School and confirmation of Faculty. The conditions governing the award of the degree are outlined on page 134.

<table>
<thead>
<tr>
<th>Hours per week</th>
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<th>Term 3</th>
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In addition, students are required to submit a thesis based on experimental and field work.
SCHOOL OF HIGHWAY ENGINEERING

The Foundation Chair of Highway Engineering has recently been established as a result of action by the New South Wales Government and is being supported from Department of Main Roads funds. It is hoped that the Chair will serve students and research workers throughout Australia and also attract students from a number of neighbouring countries. So far little attention has been paid to highway engineering by Commonwealth Universities but for some time there have been a number of similar chairs in the United States of America.

There is an immediate demand in Australia and abroad for the well trained highway engineer, and that demand is likely to rise considerably in future as the importance of road communications and the necessity for better roads is increasingly recognized. The rapid development of Australia requires a continuous programme of new road construction.

In 1959 the School will offer courses at post-graduate level leading to the degree of Master of Technology* and to a post-graduate diploma.

(a) A full-time post-graduate course of one year's duration leading to the degree of Master of Technology (M.Tech.).

(b) An evening course of two to four year's duration leading to the degree of Master of Technology (M.Tech.).

(c) An evening course of two year's duration qualifying for a post-graduate diploma.

Facilities are also available for students to carry out post-graduate studies and investigations leading to the degree of Master of Engineering or Doctor of Philosophy in the various disciplines connected with Highway Engineering.

Whilst Australian conditions will be emphasized the courses will deal mainly with the fundamental principles of highway engineering so that the student will be equipped to carry out highway work under all conditions in any part of the world. The results of the latest research in the United States of America and the United Kingdom will be examined and due emphasis given to the science of traffic engineering. The application of scientific principles to road construction has been developed comparatively recently. Road

*Conditions governing the award of the degree of Master of Technology are set out on page 134.
materials are of a heterogeneous nature and they vary immensely in their properties but recent advances in soils technology and road pavement design have gone a considerable way towards advancing the design of road pavements beyond a matter for the engineer's judgement. The soil mechanics aspect of road engineering and the location, choosing and testing of road materials will be covered thoroughly in the courses. An important section of the Master of Technology course will be devoted to the economics of bridge types and bridge design generally in reinforced concrete, prestressed concrete and steel.

COURSE XXG1—HIGHWAY ENGINEERING
(MASTER OF TECHNOLOGY)

FULL-TIME COURSE

<table>
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PART-TIME COURSE

FIRST YEAR

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<td>lec. lab./d.o.</td>
<td>lec. lab./d.o.</td>
</tr>
<tr>
<td>20.01</td>
<td>Road Location and Design</td>
<td>2 - 3</td>
<td>2 - 3</td>
<td>2 - 5</td>
</tr>
<tr>
<td>20.11</td>
<td>Pavement Design and Soil Analysis</td>
<td>2 - 2</td>
<td>2 - 2</td>
<td>2 - 2</td>
</tr>
<tr>
<td>20.31</td>
<td>Bridge Design, Part I</td>
<td>3 - 0</td>
<td>3 - 0</td>
<td>0 - 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 - 5</td>
<td>7 - 5</td>
<td>4 - 8</td>
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</table>

297
SECOND YEAR  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.011</td>
<td>Traffic Engineering</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>20.21</td>
<td>Road Construction</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20.31</td>
<td>Bridge Design, Part II</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>20.41</td>
<td>Highway Law and Contract Documents</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>


In addition to the formal course work, the student will be set a project for which he will be provided with topographical plans of an area of countryside, including some existing roads and involving the construction of new roads. The length of road considered will traverse open country, thick bush country and a mountain range, and will link two large towns and several villages. All the various aspects of highway design, including bridge design, the design of grade separation crossings, roundabouts and minor road junctions, the design of drainage facilities, the choice of route having regard to geometrical factors, soil conditions and availability of materials will be incorporated. Finally the student will be required to write a report of a type similar to that which would be submitted by a consulting engineer to a public authority.

COURSE XXG2—POST-GRADUATE DIPLOMA IN HIGHWAY ENGINEERING

Those eligible for admission to this course will be:

(a) Graduates of the University of New South Wales or other approved universities.

(b) Such applicants with other qualifications as may be approved by the Professorial Board.

Notwithstanding (a) and (b) above, the Professorial Board may require applicants to take such other prerequisite or concurrent studies and/or examinations as it may prescribe.
**FIRST YEAR**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./d.o.</td>
<td>lec. lab./d.o.</td>
<td>lec. lab./d.o.</td>
</tr>
<tr>
<td>20.01 Road Location and Design</td>
<td>2 — 3</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
<tr>
<td>20.11 Pavement Design and Soil</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>2 — 2</td>
</tr>
<tr>
<td>Analysis</td>
<td>4 — 5</td>
<td>4 — 5</td>
<td>4 — 5</td>
</tr>
</tbody>
</table>

In addition to the course work the student will be set an assignment involving the design of a length of road together with an estimate of cost and supporting statements.

**SECOND YEAR**

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./d.o.</td>
<td>lec. lab./d.o.</td>
<td>lec. lab./d.o.</td>
</tr>
<tr>
<td>19.011 Traffic Engineering</td>
<td>2 — 2</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>20.21 Road Construction</td>
<td>3 — 2</td>
<td>3 — 2</td>
<td>3 — 2</td>
</tr>
<tr>
<td>20.41 Highway Law and Contract</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Documents</td>
<td>6 — 4</td>
<td>6 — 2</td>
<td>6 — 2</td>
</tr>
</tbody>
</table>
DEPARTMENT OF INDUSTRIAL ARTS

The course in industrial arts is designed to provide a training at University level for teachers of industrial arts in the secondary schools and leads to the degree of Bachelor of Science. At the completion of this course students will have the necessary qualifications to become a certificated teacher.

The need for industrial arts education at University level has become necessary to meet the increasing demand of society for technicians and technologists. The industrial arts teacher can assist materially in the solution of this problem, not only through efficient education within his own field of knowledge but also by developing positive attitudes in the minds of his students towards science and technology. He also has much to contribute towards the general broadening of education, so necessary in this age of increasing industrial specialization. The industrial arts teacher must then possess not only technical competence in his subject but also have the theoretical knowledge necessary to develop in his students a positive attitude towards technology and science and at the same time help them reach the entrance standards required by the Universities and Technical Colleges.

The course has four general aims:

(i) To provide a sound education at University level in professional education based on the science of psychology.

(ii) To provide a thorough education at University level in those sciences and technical courses which are necessary for the teaching of industrial arts subjects.

(iii) To provide an opportunity for the study of one of the natural sciences or mathematics in reasonable depth.

(iv) To make available, through organized and integrated practical work, some opportunity for students to gain first-hand knowledge of industrial organization and education systems.

The course extends over four years of full-time study and in the second and subsequent years students are required to study a sequence of one of the following subjects: Physics, Chemistry, Mathematics, Biology or Geology. In place of the final year course in any one of these options, students may elect to study the subject History and Social Relations of Science and Technology.
## COURSE XXI—INDUSTRIAL ARTS

### FIRST YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.41 Chemistry I, Part I</td>
<td></td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>2 — 2</td>
</tr>
<tr>
<td>5.11 Engineering Drawing</td>
<td></td>
<td>0 — 3</td>
<td>0 — 3</td>
<td>0 — 3</td>
</tr>
<tr>
<td>5.21 Mechanical Technology</td>
<td></td>
<td>2½ — 0</td>
<td>2½ — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>5.41 Descriptive Geometry</td>
<td></td>
<td>1 — 2½</td>
<td>1 — 2½</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.11 Engineering Mechanics</td>
<td></td>
<td>1 — 1</td>
<td>1 — 1</td>
<td>0 — 0</td>
</tr>
<tr>
<td>10.1 Mathematics I, Part I</td>
<td></td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>2 — 1</td>
</tr>
<tr>
<td>12.01 Psychology I</td>
<td></td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>2 — 1</td>
</tr>
<tr>
<td>21.01 Industrial Education</td>
<td></td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>0 — 0</td>
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<tr>
<td>G10 English</td>
<td></td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G20 History</td>
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<td>1 — 0</td>
<td>1 — 0</td>
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**Total** 13½—12½  13½—12½  10 — 4

### SECOND YEAR

(34 weeks day course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td>1.91 Physics</td>
<td></td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>0 — 0</td>
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<tr>
<td>4.912 Materials Technology</td>
<td></td>
<td>1½ — 2</td>
<td>1½ — 2</td>
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<tr>
<td>11.21 Freehand Drawing and Presentation I</td>
<td></td>
<td>0 — 3</td>
<td>0 — 3</td>
<td>0 — 0</td>
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<tr>
<td>12.02 Psychology II</td>
<td></td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>2 — 2</td>
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<tr>
<td>21.02 Industrial Education</td>
<td></td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
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<tr>
<td>21.12 Education I</td>
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<td>2 — 0</td>
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<tr>
<td>G30 Philosophy</td>
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**Physics Option**—

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
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<th>Term 2</th>
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<tbody>
<tr>
<td>1.11 Physics</td>
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<td>3 — 3</td>
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**Total** 11½—14  11½—14  11 — 9

**Chemistry or Biology Option**—

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
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<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td>2.41 Chemistry I, Part II</td>
<td></td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
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**Total** 11½—15  11½—15  9 — 8

* Students taking this option will not be required to take 1.91 Physics.
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
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<tr>
<td><strong>Third Year</strong></td>
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<tr>
<td><strong>(34 weeks day course)</strong></td>
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<tr>
<td><strong>Hours per week</strong></td>
<td>Term 1</td>
</tr>
<tr>
<td><strong>lec. lab./tut.</strong></td>
<td>0 — 0</td>
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<tr>
<td><strong>Properties of Materials</strong></td>
<td>12 — 16</td>
</tr>
<tr>
<td>8.92c</td>
<td>0 — 0</td>
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<tr>
<td>12.03</td>
<td>2 — 2</td>
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<tr>
<td>Psychology III</td>
<td>2 — 4</td>
</tr>
<tr>
<td>21.03</td>
<td>2 — 4</td>
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<tr>
<td>Industrial Education</td>
<td>2 — 4</td>
</tr>
<tr>
<td>21.13</td>
<td>2 — 4</td>
</tr>
<tr>
<td>Education II</td>
<td>2 — 4</td>
</tr>
<tr>
<td>21.23</td>
<td>2 — 4</td>
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<tr>
<td>Wood Technology</td>
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<tr>
<td><strong>Physics Option</strong></td>
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</tr>
<tr>
<td>Physics II, Part I</td>
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<tr>
<td>Total</td>
<td>10 — 9</td>
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<tr>
<td><strong>Chemistry Option</strong></td>
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<tr>
<td>Chemistry II, Part I</td>
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<tr>
<td>Total</td>
<td>10 — 11</td>
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<tr>
<td><strong>Biology Option</strong></td>
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<tr>
<td>General Biology</td>
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<tr>
<td>Total</td>
<td>10 — 11</td>
</tr>
<tr>
<td><strong>Geology Option</strong></td>
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<tr>
<td>Geology I, Part II</td>
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<tr>
<td>Total</td>
<td>9 — 10</td>
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<tr>
<td><strong>Mathematics Option</strong></td>
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<tr>
<td>Mathematics II, Part I</td>
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<td>Total</td>
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</table>

302
**FOURTH YEAR**

*(34 weeks day course)*

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Term 1</th>
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<th>Term 3</th>
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<tbody>
<tr>
<td></td>
<td>Hours per week</td>
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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>21.14</td>
<td>Education III</td>
<td>10 - 0</td>
<td>10 - 0</td>
<td>9 - 0</td>
</tr>
<tr>
<td>21.34</td>
<td>Drawing and Design</td>
<td>0 - 3</td>
<td>0 - 3</td>
<td>0 - 0</td>
</tr>
<tr>
<td></td>
<td><strong>or</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G12</td>
<td>English</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td></td>
<td><strong>or</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G22</td>
<td>History</td>
<td>3 - 0</td>
<td>3 - 0</td>
<td>3 - 0</td>
</tr>
<tr>
<td></td>
<td><strong>or</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G32</td>
<td>Philosophy</td>
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**EITHER,**

<table>
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<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>History and Social Relations of Science and Technology</td>
<td>3 - 0</td>
<td>3 - 0</td>
<td>3 - 0</td>
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**Total** 14 - 3 14 - 3 14 - 0

**OR ONE OF,**

**Chemistry Option**—

<table>
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<th>Course Title</th>
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<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Chemistry II, Part II</td>
<td>2 - 4</td>
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<td>2 - 4</td>
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**Total** 13 - 7 13 - 7 13 - 4

**Physics Option**—

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
<td></td>
<td>Physics II, Part II</td>
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<td>2 - 2</td>
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**Total** 13 - 5 13 - 5 13 - 2

**Biology Option**—

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Zoology I, Part I or Botany I, Part I</td>
<td>2 - 2</td>
<td>2 - 2</td>
<td>2 - 2</td>
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</table>

**Total** 13 - 5 13 - 5 13 - 2

**Geology Option**—

<table>
<thead>
<tr>
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<th>Course Title</th>
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<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td>7.503</td>
<td>Petrology</td>
<td>3 - 6</td>
<td>3 - 6</td>
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</tr>
<tr>
<td>7.523</td>
<td>Stratigraphy and Palaeontology</td>
<td>3 - 6</td>
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**Total** 14 - 9 14 - 9 11 - 0

**Mathematics Option**—

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td>10.2</td>
<td>Mathematics II, Part II</td>
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<td>1 - 1</td>
<td>1 - 1</td>
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</tbody>
</table>

**Total** 12 - 4 12 - 4 12 - 1

303
## SCIENCE COURSE

In addition to the courses in Applied Science which are described under the names of the various Schools, the University offers a more broadly based course leading to the degree of Bachelor of Science.

No industrial experience is required. A Pass degree may be awarded after three years, or an Honours degree after four years, of full-time study. The course may be taken by part-time study, normally requiring seven years for the Pass degree.

Students are required to discuss the choice of their subjects with the Dean of the Faculty of Science or his representative.

Students who commenced the Science course in 1955 or later years will follow the curriculum as here set out. Students who have completed a stage of the Science course II B2 prior to 1955 may, subject to normal progression, follow the syllabus set out in the 1954 Calendar.

### COURSE XXII—SCIENCE

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.†

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>(A) HUMANITIES—</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>G10 English</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G20 History</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>0 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
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<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
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<td>2 — 0</td>
</tr>
<tr>
<td>(B) SCIENCE SUBJECTS—</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Group I</td>
<td></td>
<td></td>
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<tr>
<td>Chemistry I</td>
<td>3 — 4</td>
<td>3 — 4</td>
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<tr>
<td>Mathematics I</td>
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<tr>
<td>Physics I</td>
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<td>3 — 3</td>
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<tr>
<td>Geology I</td>
<td>3 — 4</td>
<td>3 — 4</td>
<td>3 — 4</td>
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<td>Psychology I</td>
<td>3 — 4</td>
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<tr>
<td>General Biology*</td>
<td>2 — 4</td>
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<td>2 — 4</td>
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<tr>
<td>Geography I†</td>
<td>2 — 3</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
</tbody>
</table>

* Available at Sydney only.
† Available at Newcastle only.
† A student who selects an unusual combination of subjects or subjects chosen from more than one group in one year may be required, owing to the exigencies of the time table, to attend for more than the minimum number of years and/or at night classes.

304
<table>
<thead>
<tr>
<th>Group II</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>lab./tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>Chemistry II</td>
<td>4 - 8</td>
<td>4 - 8</td>
<td>4 - 8</td>
</tr>
<tr>
<td>Mathematics II (Pure)</td>
<td>3 - 2</td>
<td>3 - 2</td>
<td>3 - 2</td>
</tr>
<tr>
<td>Mathematics II (Applied)</td>
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<td>3 - 2</td>
<td>3 - 2</td>
</tr>
<tr>
<td>Higher Mathematics II (Pure)</td>
<td>6 - 0</td>
<td>6 - 0</td>
<td>6 - 0</td>
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<tr>
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<td>5 - 0</td>
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<tr>
<td>Physics II</td>
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<td>4 - 4</td>
<td>4 - 4</td>
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<tr>
<td>Geology II</td>
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<td>4 - 6</td>
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</tr>
<tr>
<td>Psychology II</td>
<td>3 - 6</td>
<td>3 - 6</td>
<td>3 - 6</td>
</tr>
<tr>
<td>Theory of Statistics I</td>
<td>4 - 3</td>
<td>4 - 3</td>
<td>4 - 3</td>
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<tr>
<td>Chemistry IIIA*</td>
<td>3 - 6</td>
<td>3 - 6</td>
<td>3 - 6</td>
</tr>
<tr>
<td>Biochemistry I*</td>
<td>3 - 6</td>
<td>3 - 6</td>
<td>3 - 6</td>
</tr>
<tr>
<td>Botany I*</td>
<td>3 - 6</td>
<td>3 - 6</td>
<td>3 - 6</td>
</tr>
<tr>
<td>Zoology I*</td>
<td>3 - 6</td>
<td>3 - 6</td>
<td>3 - 6</td>
</tr>
<tr>
<td>Geography II†</td>
<td>2 - 3</td>
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<table>
<thead>
<tr>
<th>Group III</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>lab./tut.</td>
<td>lec.</td>
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<tr>
<td>Chemistry III</td>
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<td>4 -10</td>
<td>4 -10</td>
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<td>6 - 1</td>
<td>6 - 1</td>
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<td>4 - 8</td>
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<td>5 - 8</td>
<td>5 - 8</td>
<td>5 - 8</td>
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<td>4 - 7</td>
<td>4 - 7</td>
<td>4 - 7</td>
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<tr>
<td>Biochemistry II*</td>
<td>3 - 10</td>
<td>3 - 10</td>
<td>3 - 10</td>
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<tr>
<td>Botany II*</td>
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<td>3 - 10</td>
<td>3 - 10</td>
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<td>Zoology II*</td>
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<td>Microbiology I*</td>
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<tr>
<td>Geography III†</td>
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<table>
<thead>
<tr>
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<th>Term 1</th>
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<th>Term 3</th>
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<tr>
<td></td>
<td>lec.</td>
<td>lab./tut.</td>
<td>lec.</td>
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<tr>
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<td>3 - 2</td>
<td>3 - 2</td>
<td>3 - 2</td>
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<td>Higher Mathematics III (Applied)</td>
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<td>6 - 1</td>
<td>6 - 1</td>
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<td>Theory of Statistics II</td>
<td>4 - 4</td>
<td>4 - 4</td>
<td>4 - 4</td>
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<tr>
<td>Advanced Inorganic Chemistry</td>
<td>2 - 8</td>
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<td>2 - 8</td>
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<tr>
<td>Advanced Organic Chemistry</td>
<td>2 - 8</td>
<td>2 - 8</td>
<td>2 - 8</td>
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<td>Advanced Physical Chemistry</td>
<td>2 - 8</td>
<td>2 - 8</td>
<td>2 - 8</td>
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<tr>
<td>Physics III (Applied)</td>
<td>4 - 4</td>
<td>4 - 4</td>
<td>4 - 4</td>
</tr>
</tbody>
</table>

2. 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:

(a) the Humanities listed under Section 1 (A),

(b) eight subjects selected from the Science subjects listed under Section 1 (B) to include three subjects from Group I, three subjects from Group II, and two subjects from Group III of which at least one must be from Part (a) provided that:

(i) A student may substitute a subject from Group I for a subject from Group II; and/or

*Available at Sydney only.
†Available at Newcastle only.
(ii) A student may substitute a subject from Group II for a subject from Group III;
(iii) The proposed course must be approved by the Dean of the Faculty of Science or his representative during enrolment;
(iv) The selected course includes at least two of the subjects Chemistry I, Physics I, Mathematics I;
(v) The requirements of Section 4, with respect to pre-requisite and co-requisite subjects are satisfied;
(vi) A student may not include in his eight subjects:
   (i) both Chemistry II and Chemistry IIa;
   (ii) both Mathematics II (Pure) and Higher Mathematics II (Pure);
   (iii) both Mathematics II (Applied) and Higher Mathematics II (Applied);
   (iv) both Mathematics III (Pure) and Higher Mathematics III (Pure);
   (v) both Chemistry IIa and Biochemistry I.

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

   **First Year**
   (a) G10 English, G20 History,
   (b) Three subjects from Group I.

   **Second Year**
   (a) G30 Philosophy, Social Science Elective,
   (b) Three subjects from Group II, OR two subjects from Group II and one from Group I.

   **Third Year**
   (a) Advanced Elective (Humanities or Social Science),
   (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.

4. (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 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 indicated as pre-requisites.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Pre-requisite</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group II—</strong></td>
<td></td>
</tr>
<tr>
<td>Chemistry II A.</td>
<td>Chemistry I and General Biology.</td>
</tr>
<tr>
<td>Physics II.</td>
<td>Mathematics I.</td>
</tr>
<tr>
<td>Botany I.</td>
<td>General Biology.</td>
</tr>
<tr>
<td>Zoology I.</td>
<td>General Biology.</td>
</tr>
<tr>
<td>Biochemistry I.</td>
<td>General Biology.</td>
</tr>
<tr>
<td>Theory of Statistics I.</td>
<td>Mathematics I.</td>
</tr>
</tbody>
</table>

| **Group III—**           |                                     |
| Chemistry III.           | Mathematics I.                      |
| Physics III.             | Mathematics II (Pure) or Higher     |
|                          | Mathematics II (Pure).              |
| Botany II.               | Chemistry II A or Biochemistry I    |
|                          | or Chemistry II.                    |
| Zoology II.              | Chemistry II A or Biochemistry I    |
|                          | or Chemistry II.                    |
| Microbiology I.          | Chemistry II A or Biochemistry I    |
| Theory of Statistics II. | Mathematics II (Pure) or Higher     |
|                          | Mathematics II (Pure).              |

| Physics III (Applied).   | Physics II.                         |

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

<table>
<thead>
<tr>
<th>Subject</th>
<th>Co-requisite</th>
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</thead>
<tbody>
<tr>
<td><strong>Group II—</strong></td>
<td></td>
</tr>
<tr>
<td>Mathematics II (Applied)</td>
<td>Mathematics II (Pure) or Higher</td>
</tr>
<tr>
<td>Higher Mathematics II (Applied)</td>
<td>Mathematics II (Pure)</td>
</tr>
<tr>
<td>Biochemistry I</td>
<td>Higher Mathematics II (Pure)</td>
</tr>
<tr>
<td></td>
<td>Chemistry II</td>
</tr>
</tbody>
</table>

| **Group III—**           |                                     |
| Advanced Inorganic       | Chemistry III                       |
| Chemistry                |                                     |
| Advanced Organic         | Chemistry III                       |
| Chemistry                |                                     |
| Advanced Physical        | Chemistry III                       |
| Chemistry                |                                     |

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### Subject Co-requisite

<table>
<thead>
<tr>
<th><strong>Subject</strong></th>
<th><strong>Co-requisite</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory of Statistics II</td>
<td>Mathematics III (Pure) or Higher</td>
</tr>
<tr>
<td></td>
<td>Mathematics III (Pure)</td>
</tr>
<tr>
<td>Mathematics III (Applied)</td>
<td>Mathematics III (Pure) or Higher</td>
</tr>
<tr>
<td></td>
<td>Mathematics III (Pure)</td>
</tr>
<tr>
<td>Higher Mathematics III</td>
<td>Higher Mathematics III (Pure)</td>
</tr>
<tr>
<td>(Applied)</td>
<td>(Pure)</td>
</tr>
</tbody>
</table>

(d) Before enrolling in an Advanced Elective (Humanities or Social Science), the student shall have attended the classes and satisfied the examiners in each of the subjects:—G10 English, G20 History, G30 Philosophy and G41 or G51 or G61 or G81 Social Science Electives.

5. (a) Where any alteration in the course approved at enrolment is desired, the student must obtain the approval of the Dean of the Faculty of Science or his representative for the new course.

(b) A student who wishes to attempt an Honours degree in a School should seek the advice of the Head of that School at the end of his first-year programme (see 3 above).

(c) A student wishing to enrol in an Honours course in a School may be required to complete extra work concurrently with the Pass degree work.

### COURSE XXIIb—SCIENCE

6. For the benefit of part-time students the subjects of the courses are provided in sections so that the requirements for the Pass Degree may normally be satisfied by part-time study of approximately 12 hours per week.†

The following table shows the time allocation (hours/week) for the various subjects:

(A) **HUMANITIES**—as listed under section 1A.

(B) **SCIENCE SUBJECTS.**

<table>
<thead>
<tr>
<th><strong>GROUP I</strong></th>
<th><strong>Hours per week for 34 weeks</strong></th>
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</thead>
<tbody>
<tr>
<td>Chemistry I</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>Physics I</td>
<td>Part I</td>
</tr>
<tr>
<td>Mathematics I</td>
<td>Part I</td>
</tr>
<tr>
<td>General Biology</td>
<td>Part I</td>
</tr>
<tr>
<td>Geology</td>
<td>Part I</td>
</tr>
<tr>
<td>Psychology I</td>
<td>Part I</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>GROUP I</strong></th>
<th><strong>lec. lab./tut.</strong></th>
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</thead>
<tbody>
<tr>
<td>Chemistry I (Part I)</td>
<td>2 — 2</td>
</tr>
<tr>
<td>Physics I (Part I)</td>
<td>1 ½ — 1 ½</td>
</tr>
<tr>
<td>Mathematics I (Part I)</td>
<td>2 — 1</td>
</tr>
<tr>
<td>General Biology</td>
<td>2 — 4</td>
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<tr>
<td>Geology</td>
<td>2 — 3</td>
</tr>
<tr>
<td>Psychology I (Part I)</td>
<td>2 — 1 ½</td>
</tr>
</tbody>
</table>

† All possible combinations of subjects allowed by these regulations will not, owing to the exigencies of the time-table, be available to lead to the degree in the minimum time.
### Group II—

<table>
<thead>
<tr>
<th>Course</th>
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<th>Part II</th>
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</thead>
<tbody>
<tr>
<td>Chemistry II</td>
<td>2 — 4(av.)</td>
<td>2 — 4(av.)</td>
</tr>
<tr>
<td>Mathematics II (Pure)</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>Mathematics II (Applied)</td>
<td>2 — 2</td>
<td>2 — 2</td>
</tr>
<tr>
<td>Physics II</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
<tr>
<td>Geology II</td>
<td>2 — 2</td>
<td>1 — 4</td>
</tr>
<tr>
<td>Psychology II</td>
<td>2 — 2</td>
<td>2 — 2</td>
</tr>
<tr>
<td>Theory of Statistics I</td>
<td>2 — 1</td>
<td>2 — 2</td>
</tr>
<tr>
<td>Chemistry IIIA</td>
<td>2 — 4</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Biochemistry I</td>
<td>1 — 2</td>
<td>2 — 4</td>
</tr>
<tr>
<td>Botany I</td>
<td>2 — 2</td>
<td>2 — 4</td>
</tr>
<tr>
<td>Zoology I</td>
<td>2 — 2</td>
<td>2 — 4</td>
</tr>
<tr>
<td>Geography II</td>
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### Group III—

#### Part (a)—

<table>
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<th>Part II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry III</td>
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<td>2 — 5</td>
</tr>
<tr>
<td>Mathematics III (Pure)</td>
<td>2 — ½</td>
<td>2 — ½</td>
</tr>
<tr>
<td>Physics III</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
<tr>
<td>Geology III</td>
<td>2 — 4</td>
<td>3 — 4</td>
</tr>
<tr>
<td>*Psychology III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biochemistry II</td>
<td>1 — 5</td>
<td>2 — 5</td>
</tr>
<tr>
<td>Botany II</td>
<td>2 — 5</td>
<td>2 — 5</td>
</tr>
<tr>
<td>Zoology II</td>
<td>1 — 5</td>
<td>2 — 5</td>
</tr>
<tr>
<td>Microbiology I</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
<tr>
<td>Geography III</td>
<td>2 — 3</td>
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#### Part (b)—

<table>
<thead>
<tr>
<th>Course</th>
<th>Part I</th>
<th>Part II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics III (Applied)</td>
<td>1½ — 1</td>
<td>1½ — 1</td>
</tr>
<tr>
<td>Theory of Statistics II</td>
<td>2 — 2</td>
<td>2 — 2</td>
</tr>
<tr>
<td>Advanced Inorganic Chemistry</td>
<td>1 — 4</td>
<td>1 — 4</td>
</tr>
<tr>
<td>Advanced Physical Chemistry</td>
<td>1 — 4</td>
<td>1 — 4</td>
</tr>
<tr>
<td>Advanced Organic Chemistry</td>
<td>1 — 4</td>
<td>1 — 4</td>
</tr>
<tr>
<td>Physics III (Applied)</td>
<td>2 — 2(av.)</td>
<td>2 — 2(av.)</td>
</tr>
</tbody>
</table>

7. A part-time student must select his subjects in compliance with the regulations set out above for full-time students.

---

*Psychology III will not be offered part-time until demand for the subject increases. A psychology major is available in the Applied Psychology course on a part-time basis.*
8. (a) A suitably qualified candidate may be admitted to an Honours course in one of the following subjects requiring an extra year of full-time or two extra years of part-time work:—

(i) Biochemistry.
(ii) Botany.
(iii) Chemistry.
(iv) Geography.
(v) Geology.
(vi) Mathematics.
(vii) Microbiology.
(viii) Physics.
(ix) Psychology.
(x) Theory of Statistics.
(xi) Zoology.

(b) A student desiring admission to the Honours course must apply to the Head of the appropriate School 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.

(d) A student wishing to proceed to Honours in Physics will be required to have completed Physics III and Mathematics III (Pure) or Higher Mathematics III (Pure).

(e) A student wishing to proceed to Honours in Geography must attend special seminars while taking Geography II and Geography III.

(f) A student wishing to proceed to Honours in Mathematics must complete Higher Mathematics III (Pure) and Higher Mathematics III (Applied).

(g) A student wishing to proceed to Honours in Theory of Statistics must have completed Higher Mathematics III (Pure) and additional work in connection with Theory of Statistics I and II.
FACULTY OF HUMANITIES AND SOCIAL SCIENCES

1.—SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

All undergraduates are required to complete a number of courses in the humanities and social sciences. Students in the faculties of Science, Engineering, Technology and Architecture must take a course in each of the subjects, English, history, and philosophy, and must elect to take one of the social science subjects, psychology, economics, government or sociology. Students taking the advanced elective will complete a further course in one of the subjects already studied. In the Faculty of Commerce, students must take logic and scientific method, and either English or history, and they may elect to study a further course in the humanities or social sciences. Progression by undergraduates from year to year of their courses, and the final award of a degree, depends upon the successful completion of the subjects prescribed in this field.

The detailed requirements for students in the various degree courses are set out hereunder; fuller descriptions of the subjects offered by the School of Humanities and Social Sciences will be found on page 508 and succeeding pages.

GROUP A—DAY DEGREE COURSES

(i) *Applied Physics.*

<table>
<thead>
<tr>
<th></th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIRST YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>G10 English</td>
<td>2 2 0</td>
</tr>
<tr>
<td>G20 History</td>
<td>1 1 2</td>
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<tr>
<td><strong>THIRD YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>2 2 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2 2 0</td>
</tr>
<tr>
<td><strong>FOURTH YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Advanced Elective</td>
<td>2 2 0</td>
</tr>
</tbody>
</table>

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(ii) *Applied Chemistry; Chemical Engineering; Food Technology; Fuel Technology; Metallurgy; Wool Technology; Textile Technology.*

<table>
<thead>
<tr>
<th></th>
<th>FIRST YEAR</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Term 1</td>
<td>Term 2</td>
<td>Term 3</td>
<td></td>
</tr>
<tr>
<td>G10</td>
<td>English</td>
<td></td>
<td></td>
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<tr>
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<tr>
<td>G30</td>
<td>Philosophy*</td>
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*SECOND YEAR*

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*THIRD YEAR*

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*FOURTH YEAR*

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</table>

- Wool Technology students will take Philosophy in first and second terms.

(iii) *Engineering (Mechanical, Industrial, Electrical, Mining, Civil); Applied Geology; Surveying.*

<table>
<thead>
<tr>
<th></th>
<th>FIRST YEAR</th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Term 1</td>
<td>Term 2</td>
<td>Term 3</td>
<td></td>
</tr>
<tr>
<td>G10</td>
<td>English</td>
<td></td>
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<td>G20</td>
<td>History</td>
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*SECOND YEAR*

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*THIRD YEAR*

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</table>

*FOURTH YEAR*

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</tbody>
</table>

- Industrial Engineering students will take a special course in Psychology.

(iv) *Architecture.*

<table>
<thead>
<tr>
<th></th>
<th>FIRST YEAR</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Term 1</td>
<td>Term 2</td>
<td>Term 3</td>
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<tr>
<td>G10</td>
<td>English</td>
<td></td>
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<tr>
<td>G20</td>
<td>History</td>
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*SECOND YEAR*

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*THIRD YEAR*

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*FOURTH YEAR*

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<tbody>
<tr>
<td></td>
<td>0</td>
<td>2</td>
<td>2</td>
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</tbody>
</table>

312
(v) **Science.**

<table>
<thead>
<tr>
<th></th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIRST YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>G10 English</td>
<td>2  2  0</td>
</tr>
<tr>
<td>G20 History</td>
<td>1  1  2</td>
</tr>
<tr>
<td><strong>SECOND YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>0  2  2</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>0  2  2</td>
</tr>
<tr>
<td><strong>THIRD YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Advanced Elective</td>
<td>0  2  2</td>
</tr>
</tbody>
</table>

(vi) **Commerce (Accountancy, Economics, Statistics, Applied Psychology, Industrial Relations, Wool Commerce).**

<table>
<thead>
<tr>
<th></th>
<th>Hours per week</th>
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</thead>
<tbody>
<tr>
<td><strong>FIRST YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>G13 English or G24 History</td>
<td>2  2  2</td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>1  1  1</td>
</tr>
</tbody>
</table>

A **SUBSEQUENT YEAR**

| G30.2 Scientific Method | 1  1  1 |

Students may elect to take a further course in the humanities or social sciences as one of the optional subjects taken during the course.

(vii) **Industrial Arts.**

<table>
<thead>
<tr>
<th></th>
<th>Hours per week</th>
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</thead>
<tbody>
<tr>
<td><strong>FIRST YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>G10 English</td>
<td>1  1  2</td>
</tr>
<tr>
<td>G20 History</td>
<td>1  1  2</td>
</tr>
<tr>
<td><strong>SECOND YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>1  1  2</td>
</tr>
<tr>
<td><strong>FOURTH YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>G12 English, or</td>
<td>1  1  2</td>
</tr>
<tr>
<td>G22 History, or</td>
<td></td>
</tr>
<tr>
<td>G32 Philosophy</td>
<td></td>
</tr>
</tbody>
</table>

**GROUP B—PART-TIME COURSES.**

(i) **Applied Chemistry; Leather Chemistry; Applied Biology; Chemical Engineering; Industrial Chemistry; Food Technology; Metallurgy.**

<table>
<thead>
<tr>
<th></th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FINAL YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>G13 English or G23 History</td>
<td>2  2  2</td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>1  1  1</td>
</tr>
<tr>
<td>G43 Economics or G63 Psychology or G83 Sociology</td>
<td>2  2  2</td>
</tr>
<tr>
<td>G50.1 Government</td>
<td>1  1  1</td>
</tr>
</tbody>
</table>
(ii) **Engineering (Mechanical, Electrical, Civil, Industrial) ; Applied Geology** ; Surveying.

<table>
<thead>
<tr>
<th></th>
<th>Hours per week</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Term 1</td>
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<tr>
<td><strong>SECOND YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>2</td>
</tr>
<tr>
<td><strong>FOURTH YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1</td>
</tr>
<tr>
<td><strong>SIXTH YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Philosophy</td>
<td>2</td>
</tr>
<tr>
<td><strong>SEVENTH YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2</td>
</tr>
</tbody>
</table>

*Students in Applied Geology will take Philosophy in fifth year, and Social Science Elective in sixth year.*

(iii) **Applied Psychology.**

<table>
<thead>
<tr>
<th></th>
<th>Hours per week</th>
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<tbody>
<tr>
<td></td>
<td>Term 1</td>
</tr>
<tr>
<td><strong>FIRST YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>2</td>
</tr>
<tr>
<td><strong>SECOND YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>2</td>
</tr>
<tr>
<td><strong>THIRD YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Philosophy</td>
<td>2</td>
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</tbody>
</table>

(iv) **Science.**

<table>
<thead>
<tr>
<th></th>
<th>Hours per week</th>
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<tbody>
<tr>
<td></td>
<td>Term 1</td>
</tr>
<tr>
<td><strong>FIRST YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>1</td>
</tr>
<tr>
<td><strong>SECOND YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1</td>
</tr>
<tr>
<td><strong>THIRD YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Philosophy</td>
<td>0</td>
</tr>
<tr>
<td><strong>FOURTH YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2</td>
</tr>
<tr>
<td><strong>FIFTH YEAR</strong></td>
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<tr>
<td>Advanced Elective</td>
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</tbody>
</table>

Hours per week.
Term 1. Term 2. Term 3.

**FIRST YEAR**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G13 English or G24 History</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**A SUBSEQUENT YEAR**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G30.2 Scientific Method</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Students may elect to take a further course in the humanities or social sciences as one of the optional subjects taken during the course.

**GROUP C—CONVERSION COURSES.**

Students must take *two* courses, *one* to be chosen from the following *three*:

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G13 English</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>G23 History</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>G33 Philosophy</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

and *one* to be chosen from the following *four*:

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G43 Economics</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>G53 Government</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>G63 Psychology</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>G83 Sociology</td>
<td>2</td>
<td>2</td>
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</tr>
</tbody>
</table>

The two courses may be taken concurrently or in different years.

**Humanities Elective Subjects (Faculty of Commerce)**

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>G14.1 English</td>
</tr>
<tr>
<td>G14.2 English</td>
</tr>
<tr>
<td>G25 History</td>
</tr>
<tr>
<td>G34 Philosophy</td>
</tr>
<tr>
<td>G54 Government</td>
</tr>
</tbody>
</table>

**Humanities Elective Subjects (Other Faculties)**

The full range of elective subjects is:

- G41 Economics
- G51 Government
- G61 Psychology
- G81 Sociology
- G12 English
- G22 History
- G32 Philosophy
- G42 Economics
- G52 Government
- G62 Psychology
- G72 Painting, Sculpture and Allied Arts.
- G82 Sociology
- G92 History of Science

Social Science Elective subjects.

Advanced Elective subjects.
Courses leading to a degree in Arts are offered at the Newcastle University College. Prior to the passing of the University of New South Wales Act, 1958, these courses led to the award of the B.A. degree of the University of New England. The 1958 Act, however, gave the University power to award its own degree in this field, and from 1959 students enrolling in Arts courses at Newcastle will proceed to the degree of Bachelor of Arts of the University of New South Wales.

A degree of Bachelor of Arts (B.A.) is awarded in two grades (Pass and Honours) and what is required of Honours students differs substantially after the first year from what is required of Pass students. The option to undertake a Pass or an Honours course is exercised by the student generally at the beginning of the second academic year. The present regulations require that to secure a Pass B.A. students must have to their credit nine “qualifying courses” obtained in not less than three years; to secure a B.A. with Honours students are required to qualify in eight courses normally taken over a four-year period. A “qualifying course” is a course in which a student has passed and which meets certain requirements regarding “groups” and “sequences”. Attendance at lectures is compulsory and satisfactory completion of class work (essays, exercises, etc.), is a pre-requisite for candidature at the annual examinations.

**Selection of Courses**

In 1959 the following courses preparatory to a degree in Arts will be offered at Newcastle.

**Group I**

- English
- French
- German
- Latin
- Greek
Elementary courses in German and in Greek may also be offered if suitably qualified students are forthcoming. An elementary course only counts as a “qualifying course” for a degree if it forms the first of a sequence of three; and not more than one such course may be counted as a “qualifying course” towards a degree.

**GROUP II**

History  
Philosophy  
Pure Mathematics

**GROUP III**

Economics  
Education  
Geography  
Psychology

**GROUP IV**

Applied Mathematics  
Chemistry  
Geology  
Physics

Candidates are required to pass in nine courses chosen from at least two groups: a maximum of three qualifying courses can be chosen from Group IV.

**Sequences**

A major sequence is a subject studied in three consecutive courses (e.g., English I, English II, English III).

A minor sequence is a subject studied in two consecutive courses (e.g., English I, English II).

The nine courses for the degree must comprise one of the following patterns of sequences:

(a) Two major sequences, one minor sequence and one other subject.

(b) Three major sequences (three third-year courses may be taken in one year only by special permission of the Faculty).

(c) One major sequence and three minor sequences.

(d) Two major sequences and three first-year courses.

(e) One major sequence, two minor sequences and two first-year subjects.

Degree courses of patterns (c), (d) and (e) require the approval of the Faculty.
Candidates are not permitted to take the courses in Education until they have completed two other qualifying courses including either Philosophy I or Psychology I. Education I may be counted as the second of a sequence of two courses of which the first is either Philosophy I or Psychology I.

Graduates in other Faculties who desire to obtain the degree of Bachelor of Arts (either Pass or Honours) must complete at least seven courses in Arts chosen in accordance with the regulations after special approval has been granted in each individual case.

Candidates desiring to graduate with Honours are subject to slightly different regulations as to the choice of the eight qualifying courses, which are to be taken in a minimum period of four years.

Honours are at present offered in English, French, German, History, Philosophy, Psychology, Economics, and Geography.
**DESCRIPTION OF SUBJECTS OF INSTRUCTION**

The description of subjects given below is meant to indicate the nature of the work dealt with in the individual subjects which make up the various courses.

The list as given below is subject to change without notice.

**PHYSICS**

Subjects 1.00 to 1.92

and Physics (Science)

The scope of instruction in Physics given in courses, other than the Science course, is summarised in the table below. The various numbered subjects appearing in the curricula of these courses comprise sections or groups of sections as indicated in the table. The topics covered in these sections are set out following the table.

Descriptions of the physics subjects available in the Science course are set out on pp. 327 to 331.

<table>
<thead>
<tr>
<th>Subject Designation</th>
<th>Comprises sections—</th>
<th>Appears in Course(s)—</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11</td>
<td>ABCF</td>
<td>I, II, III, IIIA, IV, VIIA1, XIII</td>
</tr>
<tr>
<td>1.11 Part I</td>
<td>A</td>
<td>IIb1, IIb3, IIIb1, IIIb2, IIIb3, IVb.</td>
</tr>
<tr>
<td>1.11 Part II</td>
<td>BCF</td>
<td>I, XIII*</td>
</tr>
<tr>
<td>1.12</td>
<td>DEGH</td>
<td>VI.</td>
</tr>
<tr>
<td>1.12A</td>
<td>CDEFF</td>
<td>I, XIII*</td>
</tr>
<tr>
<td>1.13</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>1.14</td>
<td>J</td>
<td>I</td>
</tr>
<tr>
<td>1.41</td>
<td>AB</td>
<td>V, VI, VII, VIIA, VIII, VIIA, IX**, XVIII.</td>
</tr>
<tr>
<td>1.42</td>
<td>DEF</td>
<td>VB, VB1, VIb, VIIb, VIIb1.</td>
</tr>
<tr>
<td>1.41D</td>
<td>A</td>
<td>VB, VB1, VIb, VIIb, VIIb1, VIIIb1.</td>
</tr>
<tr>
<td>1.42D</td>
<td>BDEF</td>
<td>VIIb, VIIIb1, VIIIc.</td>
</tr>
<tr>
<td>1.43D</td>
<td>CP'H</td>
<td>VIIb, VIIc1, VIIc2, VIIc3.</td>
</tr>
<tr>
<td>1.91</td>
<td>N</td>
<td>XI.</td>
</tr>
<tr>
<td>1.92</td>
<td>DEG</td>
<td>II, IIb1, III, IIIb1, IIIb2, IV, IVb, IVc1, VIIA1, XIII.</td>
</tr>
</tbody>
</table>

* For students in Textile Physics.
† For students in Textile Engineering.
** Students in course IX (Wool Technology) take only 1.41.
Section A

Mechanics


Light


Heat


Electricity


Section B

Electricity and Magnetism


Wave Motion and Sound


Section C

Properties of Matter

SECTION D

Physical Optics


SECTION E

Electricity and Magnetism


SECTION F


Radioactivity and radioactive transformations.

Neutron, positron, neutrino, mesons.

Nuclear reactions. Accelerators.

Fission, fusion. Cosmic rays.

SECTION F’

Introduction


Conduction in Gases


Conduction in Solids

SECTION G

Electronics

SECTION II

Thermodynamics and Physics of Gases

SECTION I

Electricity

Electron Optics
Electron refraction, electrostatic and magnetic electron lenses. Electrolytic and other models. The electron microscope, cyclotron, betatron, linear accelerator. Gas discharge devices.

Advanced Wave Motion and Radiation

Thermodynamics, Quantum Theory, and Solid State Physics

SECTION J

Subdivisions marked (E) are electives of which the student will take two only.

Instrumentation and Techniques
Atomic and Nuclear Structure

The energy levels of electrons in isolated atoms and molecules and the theory of spectral lines. Nuclear phenomena and an introduction to nuclear theory.

Structure of Matter and Radiation


Acoustics (E)


Theory and Application of Ferromagnetism (E)


Rheology


Introduction to Relativity


Theory and Application of Dielectrics (E)


The Solid State


Physics of H.F. Electromagnetic Waves (E)

SECTION K
Two series of lectures covering—
(i) Electrical discharges (one term).
   Precision electrical measurements (one term).
   General mechanics (one term).
(ii) Atomic, nuclear and solid-state physics.

SECTION L
Two series of lectures covering—
(i) Electromagnetic theory and advanced optics.
(ii) General mechanics and statistical mechanics.

SECTION M
Two series of lectures covering—
(i) Advanced thermodynamics and solid-state physics.
(ii) Electron dynamics, relativity theory and elementary quantum mechanics.

SECTION N
Mechanics
   Fundamental measurements and units, scalar and vector quantities, kinematics, dynamics, work, power, energy, friction. Conservation of momentum and energy. Equilibrium of systems, gravitation, centre of gravity.
   Circular motion, harmonic oscillation.
   Hydrostatics.

Kinetic Theory and Heat
   Structure of solids, liquids and gases, elasticity, surface tension.
   Heat, temperature, expansion and change of state, latent heat, calorimetry, gas laws, heat transfer.
   Meteorology and humidity.

Electricity
   Static electricity, atomic nature of electricity (oil drop experiment), the planetary atom, electronic theory of metals and insulators, electrical current, heating effects, magnetic effects, measurements, other charged particles, e/m. Electromagnetic induction, generators, alternating currents, transformer.

Wave Motion
   Transmission of harmonic vibration, Huyghens’ construction, wavelength, frequency, velocity, energy flow, reflection, refraction and absorption, interference and sound as an example, production of
sound, measurement of sound. Light, velocity, ray treatment of geometrical optics, photometry, dispersion, spectra, colour, electromagnetic spectrum. Photoelectric effect.

Properties of nucleus.
Measurement and analysis of particles, natural and artificial radioactivity, energy from the nucleus.

**PHYSICAL TECHNIQUES**

1.21 **PHYSICAL TECHNIQUES I: LABORATORY GLASS-BLOWING**
A practical course in glass working. Basic operations, types of glass, graded seals, annealing, devitrification, glass-metal seals.

1.22 **PHYSICAL TECHNIQUES II: HIGH VACUUM TECHNIQUE**
General survey, pumping systems, gauges, use of glass in high vacuum work, degassing and pretreatment, gas absorbents and getters. Miscellaneous techniques.

1.23a **PHYSICAL TECHNIQUES III: ELECTRONIC WORKSHOP PRACTICE**
A laboratory course covering valve characteristics, power supplies, amplifiers, oscillators. Valve voltmeters, mixing circuits, CRO.

1.23b **PHYSICAL TECHNIQUES IV: OPTICAL DESIGN AND WORKSHOP PRACTICE**

1.23c **PHYSICAL TECHNIQUES V: PHOTOMETRY, PHOTOGRAPHY AND COLORIMETRY**
Light sources, the photographic spectrum, visual, photographic and photoelectric detection of radiation. Photometry, spectrophotometry and colorimetry. Description and theory of photographic processes and materials. Colour photography.

1.23d **PHYSICAL TECHNIQUES VI: INSTRUMENT DESIGN**
Optometrical Science Conversion Course Subjects

Advanced Visual Physiology and Physiological Optics

This course will be divided into two sections, each comprising 2½ hours of lectures and demonstrations per week for one year. The two sections may be taken concurrently in one year or in any sequence in different years.

Section I

A. Visual Physiology

A study of the advanced literature on—The anatomy and physiology of the retina and visual pathways. The retinal image and visual acuity. The dioptric constants of the eye and the aetiology of refractive errors. The perception of light and brightness. The electro-physiology of vision. Dark- and light-adaptation, night vision. Accommodation. Mechanisms of the pupil. The ocular circulation and intra-ocular pressure. The applications of visual physiology to visual problems in industry, aviation, etc.

B. Photometry and Colorimetry

(For this section, given during Second Term, students will join the class in Laboratory Arts IV conducted by the School of Physics.)


C. Colour and Colour Vision


Section II

Ocular Motility and Binocular Vision


Advanced Clinical Optometry


Students taking this course will partake in research projects and the preparation of research reports.
MATHEMATICS AND STATISTICS

Elementary analytical geometry. Elementary differentiation and integration. The elements of statistical theory, including significance tests and an introduction to the analysis of variants.

Throughout this course, examples of the application of these topics to optometric and allied problems will be given wherever possible.

Science Course Subjects

PHYSICS I (SCIENCE)

Mechanics


Light


Heat


Electricity and Magnetism


Properties of Matter


PHYSICS II (SCIENCE)

Mechanics

**Physical Optics**


**Thermodynamics and Kinetic Theory of Gases**


**Electricity and Magnetism**


**Quantum Physics**


**Physics III (Science)**

**Quantum Mechanics**


**Electromagnetic Theory**

Relativity


Thermodynamics and Statistical Mechanics


Nuclear Physics


Electricity


Physics III (Applied) (Science)

This subject comprises six units each of approximately 48 hours of instruction, to be selected from the following list, not less than four units being chosen from section A.

Section A

1 and 2. Vacuum and Gas-Discharge Physics (2 units)

Lecture course on principles of production and measurement of vacua. Ionisation and the principles of electric discharges in gases. Applications of vacuum technique in tube manufacture, optics, processing of materials. Electrical and luminous characteristics of discharge devices. Appropriate laboratory demonstrations and exercises, the latter preceded by short course in elementary glass work.

Thirty-four hours lectures, approximately 60 hours laboratory.
3. **Electronic Practice**

Laboratory work, accompanied by lecturettes, on construction and testing of multi-tube electronic circuits (amplifiers, oscillators, pulse generator, scaler, etc.) and on use of electronic instruments (CRO, BFO, impedance bridge, wave analyser, etc.), at audio and radio frequencies up to 50-100 Mc/s.

Approximately 48 hours laboratory.

4. **Nucleonics and Neutron Physics**

Laboratory course on nucleonic instruments, accompanied by lecturettes, and their use in study of radioactivity and nuclear radiations, and of neutrons and their properties.

Approximately 30-40 hours laboratory.

5. **Photometry and Photography**

Lecture course on thermal radiation, spectral distribution, photometric units and instruments, colorimetry, illumination, photographic materials, instruments and techniques. Short laboratory course.

Approximately 36 hours lectures, 20 hours laboratory.

6. **Optical Instruments**

Lecture course on theory of optical instruments, field of view, stops, pupils, image brightness, contrast, etc. Introduction to aberrations. Appropriate laboratory exercises. Also short laboratory course on lens making.

Twenty-four hours lectures, 36 hours laboratory.

7. **Physical Analysis of Materials**

Lecture course on elements of physical methods for investigating composition, and texture and structure including spectroscopic and X-ray analysis, mass-spectrometric analysis, radiography, ultrasonic testing. Some laboratory exercises, and demonstrations.

Thirty-six hours lectures, 18 hours laboratory.

8. **Acoustics**

Lecture course on sound, acoustic transducers, measurement of intensity and frequency, waveform analysis, distortion. Noise and its analysis. Noise suppression, acoustic absorbent materials, measurement of their characteristics. Acoustics of auditoria and their control. Appropriate laboratory experiments throughout.

Twenty-four hours lectures, 24 hours laboratory.
SECTION B

1. 5.11d Engineering Drawing.

2. 6.23a Electric Power Engineering.
   or
   6.94 Electrical Engineering (excluding electronics).

3. 10.63 Statistics.
   or
   10.92 Statistics.

4. UTECOM Programming Course.
CHEMISTRY
Subjects 2.00 to 2.85; Leather Chemistry and Chemistry (Science)

2.111 CHEMISTRY
The aim of this subject is to give students in Engineering courses a general understanding of the fundamentals of chemistry from the viewpoint of modern theories.

General Elementary Chemistry
Physical and chemical changes, elements, compounds and mixtures; relative abundance of elements; atoms, molecules, formulae, valency. Oxides, acids, bases, salts—their classification, methods of preparation and general properties, solubility rules. Equivalent weights, normal solutions, calculations based on chemical equations, valency change. The atmosphere, oxygen, nitrogen, the inert gases, carbon dioxide, carbon monoxide, hydrogen, ammonia, sulphur dioxide, hydrogen sulphide, the halogens. Electrochemical series, action of water and acids on metals. Revision of the gas laws. Chemical calculations involving the use of the gas laws.

Atomic and Molecular Structure
Structure of the atom, evidence for the existence of protons, electrons and neutrons, nucleus. Atomic number, Moseley's characteristic radiation, mass number, isotopes and atomic weights, mass spectrograph. Atomic structure and electronic configuration of the elements, quantum mechanical concept of the atom as developed from the Rutherford-Bohr picture of the atom. Valency in terms of atomic structure. Electrovalent, covalent and co-ordinate bonds, electronic and structural formulae. Oxidation and reduction from the point of view of electron transfer, applications to volumetric titrations.

Solutions and Chemical Equilibria
Solutions, Raoult’s law, vapour pressure lowering, boiling point elevation and freezing point depression. Brief mention of the crystalline state. Properties and types of colloids, methods of preparation, coagulation and stabilization, industrial applications of colloids and colloidal systems. Theory of ionization, evidence for ionization, electrolytes and non-electrolytes, strength of acids and bases, ionic reactions. Faraday’s laws, electrolysis, standard electrode potentials. pH and indicators, hydrolysis, brief mention of buffer solutions, water treatment. Chemical equilibria, homogeneous and heterogeneous reactions, factors influencing the rate of a chemical reaction, law of mass action, Le Chatelier’s principle, mechanism of reaction, energy of activation, catalysis. Heats of reaction and formation, Hess’ law of heat summation, equilibrium constants, with some reference to reactions at high temperature.
The Periodic Table

Periodicity of the properties of the elements, classification, group valency. General relationships of the periodic table, chemistry of some of the more common metals (Fe, Pb, Cu, Zn, Al.).

Organic Chemistry


2.23 Chemical Instrumentation

An introduction to certain aspects of applied physics which will acquaint students with the instruments in common use in chemical laboratories. The subject matter is illustrated by reference to the optical instruments and electrical and electronic devices which a chemist will meet in industrial practice.

Microscopy is dealt with as a separate section within the course.

2.32 and 2.32a Physical Chemistry

An introduction to the interpretation of the physico-chemical properties of systems in terms of intra- and inter-molecular forces, molecular architecture and energy distribution.

Kinetic Theory of Gases—Real gases, elementary quantum theory, thermal properties of gases.

The Solid State—Ionic solids, covalent solids, metals, van der Waal’s solids, heat capacity of solids.

The Liquid State—Structure of liquids, vapour pressure, surface tension, viscosity.

Chemical Thermodynamics—The first, second and third laws and their application to physical and chemical equilibria.

2.32d Physical Chemistry

This course is based on 2.32 Physical Chemistry, with variations in emphasis and content matter to render it more appropriate for students specialising in biological sciences.
2.33 Physical Chemistry

The application of kinetic and thermodynamic methods wherever possible to the following:

(i) The phase rule—system of one, two and three components.
(ii) Solution—electrolytes and non-electrolytes.
(iii) Electrode processes.
(iv) Surface chemistry and colloids.
(v) Chemical kinetics.

2.34 and 2.34d Physical Chemistry

A more detailed study of certain subjects, including the following:

(i) Surface chemistry and colloidal systems.
(ii) Thermodynamics, with reference to systems which depart from ideal behaviour.
(iii) Chemical spectroscopy; a review of atomic and molecular spectra.
(iv) Chemical kinetics and other rate processes.

Seminars are conducted in the latter part of the year on physico-chemical topics.

2.35 Applied Physical Chemistry

This course consists of one lecture per week throughout the year and associated practical work.

Physical methods for the investigation of molecular structure such as dipole moments, spectroscopy, X-ray and electron diffraction, nuclear magnetic resonance spectroscopy, surface films, etc. Examples to illustrate the use of these methods.

Special topics as time permits, e.g., mass spectroscopy, advanced colloid chemistry, electron microscopy, gas chromatography, or other subjects of current importance.

2.41, 2.41a and 2.41b General Chemistry

This course of 102 lecture hours is given in first year to full-time students as an integrated whole. For part-time degree courses the subject is divided into Part I (68 lectures in first year) and Part II (34 lectures in second year). The aim of the course is to give the student an appreciation of chemistry as a whole before it is treated in its usual sections. For that reason an introductory rather than a detailed treatment of the theoretical topics is required.
Part I


Periodic table. General introduction—atomic volumes, covalent radii, ionic radii, ionisation potentials, general trends in periodic table, general idea of transition series, rare earth series, etc. Detailed treatment of elements of Periodic Groups IA, IIA, VA, VIA, VIIA.


Part II

Qualitative Analysis; dry tests. Group separation tables. Discussion of individual group separations. Identification of anions.


Periodic table. Group III, B and Al; Group IB, Cu, Ag and Au; Group VIII, Fe, Co and Ni.

2.42 and 2.42D INORGANIC CHEMISTRY

Molecular structure. Qualitative idea of way in which physical methods are used to determine structure of molecules. Structure of ionic lattices. Simple examples like CsCl, NaCl, CaF₂. Shape of covalent molecules. A knowledge of various shapes and examples. In simple cases, relationship of shape to atomic orbitals involved.

Periodic table. Group II (Zn, Cd and Hg); Group III (Ga, In and Tl); Group IV (Si, Ge, Sn and Pb; Ti, Zr, Hf and Th); Group V: Further treatment of nitrogen compounds like HN₃, N₂H₄, NH₂OH, nitrogen halides and sulphides. V, Cb and Ta. Group VI: Further treatment of sulphur; sulphur halides, oxyhalides. Se and Te. Cr, Mo and W. Group VII: Interhalogen compounds, oxyacids and peracids. Mn, Tc and Re. Group VIII: General properties and discussion of heavier Group VIII elements.

Rare earth and actinides. Stable valencies and general relationships. Carbonyls, carbonyl hydrides, halides and nitrosyls. Relatively brief discussion of preparation and properties.

2.44 AND 2.44D INORGANIC CHEMISTRY

This course consists of one lecture per week throughout the year and associated practical work.


Review of chemistry of complex compounds; chemistry of Group VIII elements.

Radiochemistry—preparation, separation and identification of the transuranes. Nuclear fuel processing and production of radioisotopes from fission products.

Reaction mechanisms—methods and results for complex compounds.

Compounds showing unusual bond types—carbonyls, nitrosyls, boron hydrides, ferrocenes, olefine complexes, copper acetate and related compounds.

Special topics as time permits, e.g., interhalogen compounds reactions in non-aqueous solvents, organo-metal chemistry.
2.52 AND 2.52A QUANTITATIVE ANALYSIS


The theoretical treatment will be accompanied by a course of practical exercises to illustrate the important techniques in quantitative analysis and the use of the reagents discussed.

2.53 QUANTITATIVE ANALYSIS

Amplification of topics such as buffer action, ionic equilibria, redox potentials, electrode potentials, with some mathematical illustrations.

Study of methods of separation used in analytical work including use of organic reagents.

Systematic study of analytical chemistry of a selected number of elements.

The practical work will illustrate these principles

2.54 AND 2.54D QUANTITATIVE ANALYSIS

The course will consist of thirty lectures accompanied by appropriate practical work. The following topics will be discussed:

(i) Electrochemical analysis: polarography, coulometry and amperometry.

(ii) The theory and practice of chromatography and ion-exchange.

(iii) Emission spectrography and its application to chemical analysis.

(iv) Spectrophotometric methods of analysis.
(v) Reactions in non-aqueous media and their applications to analysis.

(vi) Complex formation in analytical chemistry. Factors affecting stability; measurement of stability constants; metal-ion titrations and metal-ion indicators.

(vii) Use of radioisotopes in chemical analysis. Radioactivation analysis.

2.62 Organic Chemistry

The systematic chemistry of the chief classes of organic compounds, with emphasis on the aliphatic types and a brief discussion of the corresponding aromatic compounds. Alkanes, alkenes, alkynes, aromatic hydrocarbons, cycloalkanes, alcohols, alkyl halides, ethers, carbonyl compounds, acids, esters, amides, amines and nitro compounds. An introduction to stereochemistry, proteins, fats and oils.

2.63 Organic Chemistry


2.64, 2.64a and 2.64d Organic Chemistry

An advanced treatment of specialised topics in organic chemistry. Reaction mechanism, stereochemistry, structural carbohydrate chemistry and selected topics from carbocyclic chemistry and the oxygen and nitrogen heterocyclic fields (including natural products).

2.65 (2.65a and 2.65b) Applied Organic Chemistry

This subject covers the application of chemical reactions and physical techniques to structural and analytical determinations in organic chemistry.
Emphasis is placed on the correlation of reactivity with structure. Subject matter is selected from either—

2.65A The behaviour of fixed oils, essential oils, alkaloids, fine chemicals, vitamins, carbohydrates, natural and synthetic high polymers, etc.

or

2.65B The chemistry of food constituents with particular reference to changes during processing and storage.

2.72 Mathematical Chemistry

This course and 2.73 are intended to follow the normal mathematics course given to students in first year, and aim to apply the work done in that year to problems which arise in Applied Chemistry, and, in addition, to introduce some specialised techniques such as dimensional analysis. Consideration is given to the proper presentation, critical examination, and assessment of experimental data, and to the design of experiments.

General Chemical Calculations—Elementary problems in chemical equilibria, mixtures, etc. The solution of typical transcendental and higher degree algebraic equations encountered in chemistry.

The Handling of Experimental Data—Non-statistical methods of arranging and handling experimental data.

Dimensional Analysis—General dimensional methods and their applications.

Differential Equations—Meaning, significance, use and application in chemical phenomena.

2.72A Mathematical Chemistry

A course for students in Applied Chemistry.

This course is intended to follow the normal mathematics course given to students in 1st year and aims to apply that work, combined with elementary statistical methods, to problems which arise in applied chemistry.

Topics—The collection and arrangement of experimental data; estimation of parameters, tests of significance and interpretation; estimation of errors and effects of small changes; graphical representation of associated measurements; smoothing, equation fitting and manipulation (interpolation, etc.), testing for trend.

2.73 Mathematical Chemistry

2.85 Nuclear and Radiation Chemistry

This course consists of one lecture per week throughout the year accompanied by appropriate practical work.

Nuclear structure and nuclear transformation, characteristics of nuclear radiation and its detection, interaction of radiation with matter, preparation of radio-isotopes, chemistry of nuclear transformation, radiation chemistry, formation and identification of new elements, application of radio-isotopes.

Materials for Leather Manufacture

A study of tanning materials, heavy chemicals, dye stuffs, oils and finishing materials used in the manufacture of leather. Sources, use and economic importance.

Principles of Light Leather Manufacture

The processing of shoe upper leathers, finishing leathers, luggage, upholstery leathers, etc.

Principles of Heavy Leather Manufacture

The tannage and finishing of sole, felt and harness leathers.

Science of Leather Manufacture


Analytical Chemistry of Leather Manufacture

Simple routine procedures are not included in this course. Lectures are devoted to research techniques and physical testing of leather.

Mycology of Leather Manufacture

LEATHER LABORATORY

Students undertake a research project under direction.

Science Course Subjects

CHEMISTRY I (SCIENCE)

As for 2.41 General Chemistry.

CHEMISTRY II (SCIENCE)

A course of lectures incorporating the subject matter of 2.32 Physical Chemistry, 2.42 Inorganic Chemistry, 2.52 Quantitative Analysis and 2.62 Organic Chemistry.

CHEMISTRY IIA (SCIENCE)

A course in Chemistry for students majoring in Biological Sciences. The subject matter includes 2.32 Physical Chemistry, 2.62 Organic Chemistry and 17.13 Biochemistry.

In the part-time course the subject is divided into:

Part I

As for 2.32 Physical Chemistry and 2.62 Organic Chemistry.

Part II

17.13 Biochemistry.

CHEMISTRY III (SCIENCE)

A course of four lectures per week based on the subject matter of 2.33 Physical Chemistry, 2.44 Inorganic Chemistry, 2.53 Quantitative Analysis and 2.63 Organic Chemistry.
CHEMICAL ENGINEERING
Subjects 3.00 to 3.85
3.14 AND 3.14A INDUSTRIAL CHEMISTRY

This course aims at giving the student in Applied Chemistry, Chemical Engineering and Industrial Chemistry a broad introduction to the chemical industry.

The course will deal in general terms with the relationship of chemical industries one to the other, the development of the chemical industry in Australia, services used in industry such as water, steam, power, gas, refrigeration and electricity, fuels used in industry and the principal raw materials upon which the chemical industry in Australia is based.

The following industries will be treated in specific detail: sulphuric acid; lime, cement and plaster; salt and potassium salts; sulphide processes; lime caustic, electrolytic caustic and the mercury cell; ammonia; nitric acid; industrial gases; electric furnace products; phosphates, super-phosphates; aluminium and glass; coal carbonisation; coal tar refining; petroleum refining; petroleum cracking processes; fermentation industries—ethanol, absolute alcohol, acetone and butanol; natural oils, fats and waxes; soaps and detergents; cellulose, wood pulp and paper; acetylene production and chemicals therefrom; chemicals from ethylene and propylene; synthetic methanol and formaldehyde; the Fischer Tropsch process; production of sugar, utilisation of Bagasse.

Laboratory experiments will be carried out illustrating the principles covered in the discussion of the industries in lectures.

A short series of lectures on the principles of the writing of technical reports will be given early in first term and will be followed by a series of factory visits throughout the year. The visits will be made to industries closely connected in some way with the material of the lecture course.

3.15 INDUSTRIAL CHEMISTRY

This series of lectures over three terms will treat some of the more advanced topics of inorganic and organic process industry and in addition certain special topics will be covered on a seminar basis in the third term. Topics for formal lectures will include: survey of thermodynamics; survey of kinetics; silicone chemistry; ceramics; refractories and cermets; high pressure processes—thermodynamics, chemical equilibrium, compression, preparation of synthesis gas, ammonia synthesis in detail, types of reaction vessels, glands, closures, valves and materials; high vacuum processes; industrial chemistry of uranium and thorium; radioactive chemistry; hydrogen peroxide, per-acids and salts; sodium, calcium and magnesium; titanium, zirconium and tantalum.
Rayon; aromatic intermediates; dyestuffs; synthetic resins; insecticides; biochemical engineering.

Specialised lectures and seminars will be given on various topics such as general principles and economic factors in the chemical industry; factory location; regional development; waste disposal; internal transport, storage and packing; factory layout; the industrial structure—the stock exchange, industrial organisation, functions of various departments and the functions of management.

A number of practical assignments will be given in work in the laboratory, these illustrating as far as possible the principles of the work covered in lectures.

**ADVANCED INDUSTRIAL CHEMISTRY**

This course, which is for honours students only, carries to a further stage the work undertaken in 3.15 Industrial Chemistry and includes work on problems of management and safety in the chemical industry, problems on plant operation including costing and the general economics of the manufacture of chemical products in various places, together with some studies of advanced process chemistry. The course includes an analysis of the structure of large chemical manufacturing concerns, and a consideration of the importance of the various sections such as research, development, production, engineering, sales and commercial service in the industry.

**INDUSTRIAL CHEMISTRY PROJECT**

This project involves the study of a selected chemical process requiring investigations both in the laboratory and in the literature, and in the production of a thesis on the selected topic.

**3.24 AND 3.24D CHEMICAL ENGINEERING UNIT OPERATIONS**

The first term is devoted to a study of the basic concepts of fluid flow and heat transfer. In the second term a fundamental study of the following unit operations is made: solid-liquid extraction, liquid-liquid extraction, gas absorption, distillation and adsorption. Lectures in the third term cover the unit operations of psychrometry, drying, evaporation, flow through porous media and filtration. In the laboratory, students will carry out experiments illustrating the principles of the work covered in lectures.

**3.25 CHEMICAL ENGINEERING UNIT OPERATIONS**

In the first term a detailed treatment of the following unit operations is given: Gas absorption, rectification vacuum distillation, steam distillation, molecular distillation, multi-component, azeotropic and extractive rectification, batch rectification, liquid-liquid extraction, adsorption, sublimation and dialysis.
In the second term a detailed treatment of the following unit operations is given: solids handling, flow of solids through liquids, sedimentation, flotation, fluidisation, flow through porous media, crystallisation, centrifugation and cooling towers.

In the third term a series of advanced lectures is given on fluid flow and heat transfer.

Throughout the year students will carry out experiments designed to illustrate selected principles of the work covered in lectures.

3.34 AND 3.34D CHEMICAL ENGINEERING DESIGN

The course covers the essentially mechanical section of chemical engineering design in the first part of the year and the second part is devoted to elementary design of unit operation equipment. The topics will include:

Stress analysis of simple steel structures, elementary reinforced concrete construction, mechanical equipment (shafting, bearings, drives, agitator mechanisms, etc.), pressure vessels for low and medium pressures, code requirements, reticulation of steam, vacuum, brine and fluid services generally. Safety practices.

Elementary instrumentation, heat exchangers, solid-liquid extraction apparatus, gas absorption and liquid-liquid extraction equipment, fractionating columns, dust and mist collection equipment, evaporators, rotary driers and humidification equipment.

3.35 ADVANCED CHEMICAL ENGINEERING DESIGN

Advanced lectures will be given on the topics covered in 3.34 Chemical Engineering Design and other selected topics of particular current interest. This programme will be completed early in the year and students will then work on a Major Design Project which will be integrated closely with 3.75 Chemical Engineering Project.

3.411 CERAMICS I


3.412 CERAMICS II

Ceramic Calculations—Calculation of apparent and true porosity, apparent and true specific gravity, bulk density, shrinkage and water absorption, from experimental data. Calculations of formula weights, batch weights, equivalent weights and formula batch weights of glazes, bodies and enamels. Physical properties of glasses, glazes and enamels.

3.413 Ceramics III

Principles and Practice of Drying and Firing—Fundamental treatment of unit operation of drying applied to ceramics. Firing, fuels, heat transfer, use of refractories, furnace design.


3.44 Chemical Engineering Calculations

This course consists of one two-hour lecture per week for one year and embraces the following topics:

Units and dimensional analysis; graphical methods and nomography; empirical formulae and non-periodic curves; some application of differential equations; behaviour of gases and vapour-liquid relationships; conventions, definitions and use of thermodynamic data; materials balances including fuel calculations; energy balances; combined materials and energy balances for a process or chemical works, including the possible use of diagrams made from such data.

3.511 Paint and Varnish Manufacture I


3.512 Paint and Varnish Manufacture II

3.514 Pigments and Dyestuffs

3.521 Polymerisation I

3.522 Polymerisation II
Polymerisation mechanisms. Polymer degradation and the stability of polymer systems. Some statistical aspects of polymer systems. Some thermodynamic aspects of the polymer systems. Correlation of polymer structure and polymer properties. Developments in polymerisation.

3.531 Paint Quality Control

3.54 Chemical Engineering Materials
This course consists of two one-hour lectures per week for one year.

The properties mainly needed in materials for chemical engineering plant construction are strength, and resistance to creep, wear, fatigue, corrosion, and chemical resistance.

These properties and their industrial applications will be considered for the following materials:

A. Metals
Iron and iron alloys, steel and steel alloys, non-ferrous metals and alloys.

Methods and production and heat-treatment effects will be outlined briefly.

Protective coatings, powder metallurgy and an introduction to corrosion are included.

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B. Non-metals

Refractories—Types and properties, chemical resistance, furnaces.

Abrasives—Theory of abrasion process, applications.

Glass—Chemical glassware, heat-resistant types, glass-lined vessels.

Insulating Materials—Industrial types.

Organic Plastics—Industrial types and properties, chemical equipment, bondings, coatings.

Rubber—Crude, hard, synthetic, fabrication methods, adhesives, bearings, mountings, chemical conveyors, hose, seatings.

Concrete—Mixes, handling and placing, acid-proof, chemical tank construction.

3.55 CHEMICAL ENGINEERING MATERIALS

This course consists of one hour lecture per week and extends the topics of 3.54 Chemical Engineering Materials in a more detailed fashion. In addition lectures are given on corrosion testing.

3.611 PLASTICS AND RUBBER TECHNOLOGY I

Machinery and Processes—Mastication, mills and mixers, extruders, calenders, polymer solutions, dipping and spreading.

Component Ingredients—Types of polymers, vulcanisation of rubber, accelerators, activators, fillers and coolers.

Physical Testing—Application of British and A.S.T.M. standards to plastics and rubbers.

Synthetic Rubber—Polymerisation, manufacture, milling of G R-S, neoprene and other synthetic elastomers.

Polymer Analysis—Polymer types, rubber compounds, ash, acetone extraction, sulphur content.

3.612 PLASTICS AND RUBBER TECHNOLOGY II

Textile Technology—Types of fibres, properties, yarn counts, types of weave, applications.

Latex Technology—Properties of latex, stability, concentration, sponge and cast latex products, spreading and impregnation, vulcanisation and testing.

Plastics and Rubber Products—Manufacture of flooring materials, tyres, footwear, and thermoplastic and thermosetting products.
Polymer Physics—Rheology, surface tension, viscosity, particle size, specific heat, conductivity, infra-red and X-ray diffraction.

Physical Testing—Extension of British and A.S.T.M. standards to plastics and rubbers, properties of polymers, deformation, elasticity, second order transitions, crystallization.

Industrial Administration—Management, organisation, industrial legislation, safety regulations in plastics and rubber factories.

3.613 Plastics and Rubber Technology III

Synthetic Rubber—Advanced lectures on the manufacture and uses of special synthetic elastomers—butyl-rubber, thiokele, polyurethane, silicones.

Mould Design—Types for press injection and extrusion machines handling plastics and rubbers, materials of construction, mechanical features of design.

3.65 Chemical Engineering Thermodynamics and Kinetics.

Applied Thermodynamics
Manipulation and use of thermodynamic functions.
Thermodynamics of fluids. Calculation of thermodynamic functions from experimental data and construction of thermodynamic charts and tables. Application of results to chemical reaction equilibria, power cycles and compressible flow.

Heterogeneous equilibria. Relation between free energy, enthalpy and entropy of mixing of liquids and properties of mixtures. Liquid-vapour and liquid-solid equilibria.

Calculation of thermodynamic functions from structure of molecules.

Applied Kinetics


3.75 and 3.75d Chemical Engineering Project
The student will be given an individual project involving literature and experimental investigation, and the final preparation of a flow-sheet and design report on a selected chemical process. This project is a final test of all the earlier work the student has done, and brings together in one exercise the knowledge and experience he has gained.
INDUSTRIAL SAFETY

Organisation for industrial safety; human factors in accident prevention; physical factors in accident prevention; the contribution of medicine to industry; the functions and applications of the Factories and Shops Act, Workers' Compensation legislation.

3.814 FOOD TECHNOLOGY I

Tinplate and Glass Containers

Methods of manufacture, factors determining the suitability of tinplate, corrosion problems, lacquers, examination of cans, glass containers.

The Technology of Fruit and Vegetable Products

Raw material quality—horticultural factors, maturation of plant foods, objective methods of determination of maturity and quality control.


Dehydration and sun-drying of fruits and vegetables, techniques and equipment. Storage and changes occurring during storage. General principles of canning technology, determination of safe processes, procedures and equipment for the heat processing of canned foods, aseptic canning. The canning of fruit and vegetables, production of jams, jellies and juices. Quality control techniques.

3.824 FOOD TECHNOLOGY II

Edible Fats and Oils

Classification, extraction, refining and hardening of fats and oils. Their physical properties as related to their end use, plastic fats, flavour stability and rancidity. Superglycerinated fats. The role of fats in composite foods.

Dairy Products

Milk, composition and properties, production, transportation and storage; microbiology and pasteurisation. Condensed and dried milk: cream, butter, cheese and ice cream.

Cereals and Starches

The principal cereals, relations between properties and use. Harvesting, storage; milling technology; laboratory control. Uses of wheat flour and by-products for bread, cake, biscuits, adhesives, fermentation, stockfeed, starch, gluten, amino acid production. Starch industries. Enzyme systems of cereals, nutritional aspects.
Meat, Fish and Eggs


Normal Microbial Content of Foods

Normal microbial content of foods from public health point of view and potential spoilage. Factors affecting microbial load, in processed and unprocessed foods. Principles of diagnosis of food spoilage.

Principles of Plant Sanitation

Sanitary practices in the food industry. Principles of good industrial house-keeping.

Packages


Water Supply and Effluents

Water sources and significant qualities. Water treatments and purification. Sewerage of food processing plants.

Sugars and Confectionery


3.834 ADVANCED FOOD TECHNOLOGY

Laboratory work, lectures and seminars.

Selected topics in the fields of canning, drying, dehydration, cold storage and freezing of foods. Heat penetration studies, storage of foods in flexible containers, performance data of packaging materials, gas storage of plant foods.

Plasticity and oxidative stability of fats and oils.
METALLURGY
Subjects 4.00 to 4.912

4.12 General Metallurgy

A series of thirty-four lectures. This introductory course gives a general survey of the whole field of metallurgy and is intended to emphasise the relationship between the various branches of the subject and the subjects studied in other schools.

4.22 Metallurgical Engineering I

Principles underlying the unit processes by which metals are extracted from ores and other raw materials. Emphasis on those principles common to all metallurgical processes involving chemical reactions or changes in state. Metallurgical stoichiometry, energy and mass balances, fuels and combustion, fluid flow, heat transfer, refractories.

Introduction to recent developments in extractive metallurgical operations, with particular reference to the extraction and refining of the following metals: Fe, Zn, Pb, Al, Mg, Ti, U and Be. Classification of the various forms of extraction and refining of the basis of the important unit processes involved.

Introduction to metallurgical thermodynamics and the importance of kinetic control in discussions relating to chemical equilibria. Detailed consideration of gas-solid equilibria, particularly in relation to the gaseous reduction of metal oxides.

Laboratory work designed to illustrate these principles will be performed. In addition, a series of tutorials is given to supplement the lectures.

4.23 Metallurgical Engineering II

A detailed consideration of the unit metallurgical processes which form the basis of metal extraction and refining, followed by a series of lectures in Term 3 which present the operations of selected industrial extraction centres on an integrated basis.

The unit processes are considered in turn, particular attention being given to the physico-chemical principles involved and to the field of application in industry. Processes considered include sintering and pyro-agglomeration techniques, roasting, smelting, calcining, gaseous reduction of metal compounds, retort reduction, pyro-refining techniques, thermal dissociation and disproportionation, electro-winning and electro-refining, hydrometallurgical and other low temperature solution techniques.
This consideration of unit metallurgical processes is supported throughout the year by the following topics, each extending over one term:

(i) Advanced metallurgical thermodynamics, with particular reference to solutions of metals and non-metals at high temperature.

(ii) Furnace and high temperature technology.

(iii) Applied electrochemistry.

In addition, lectures dealing with the engineering principles and practices involved in metal extraction and refining will be given for a period of two terms, particular reference being made to materials handling, process control, phase separation, vaporization processes and diffusional operations. Laboratory work supporting the lecture programme covers aspects of metallurgical thermodynamics and kinetics, engineering principles and processes and specially designed projects associated with selected unit processes.

4.24 Metallurgical Engineering III

Modern theories of the liquid and solid state studied in detail following the introductory series given in 4.22 and 4.23. Particular emphasis given to the kinetics of metallurgical processes, structural chemistry of metallic compounds and current developments in thermodynamics of metallic and non-metallic systems at elevated temperatures.

In addition, a series of lectures present current advances in the extraction and refining of metals, particularly in relation to the reactive and noble metals. The series concludes with a further discussion of certain engineering aspects of process metallurgy, the topic covering such matters as the continuous casting of metals, combustion and flame propagation research, the problem of heat transfer in metallurgical processes and process control systems.

4.32 Physical Metallurgy I

The nature of alloys; phase equilibrium in alloy systems and its relation to the temperature and composition dependence of the free energies of alloy phases. The physical factors determining the phases and phase boundaries in alloy systems. Elementary treatment of the mechanism of phase transformations. Departures from equilibrium, metastable transition phases, principles of heat treatment. Generation of microstructures, influence of surface tension. Relations between structure and properties. Application and further development of these principles by means of a detailed study of the plain carbon steels and cast irons.
The crystal structures of metals and alloy phases, the concept of atomic diameter. Structure sensitive and structure insensitive properties, anisotropy. Physical original of properties such as elasticity, thermal expansion, etc. The free electron theory, cohesion of crystals.


Laboratory work includes preparation of alloys, mechanical testing of cold worked and heat treated specimens, pyrometry, dilatometry, thermal analysis, macro examination of cast and wrought products, and a study of microstructures of brasses, aluminium bronzes and plain carbon steels in the "as cast" and heat treated conditions.

4.33 Physical Metallurgy II

The stereographic projection, X-ray diffraction and applications to metallurgical problems. The development of modern theories of solids from the free electron theory. Applications in the fields of electrical conduction, magnetism, theory of alloy phases, etc.

The plasticity of metal crystals, geometry of slip. Critical shear stress, easy glide, single and double slip, fracture. Effects of alloying, rate of straining and temperature. Application to polycrystalline aggregates. Stress-strain curve of polycrystalline aggregates, inhomogeneities of deformation, deformation bands. Preferred orientations, origin, nature, determination and effects.


4.34 Physical Metallurgy III

A series of lectures on advanced aspects of physical metallurgy dealing with such topics as the application of dislocation theory to strain hardening, fracture, fatigue, creep, recovery and recrystallisation. Internal friction. Theories of the mechanism of phase transformations. Radiation damage to metals, defects.

The list of topics given is not necessarily complete and may be changed from time to time.

Laboratory work will include the use of advanced techniques in X-ray diffraction, microscopy, dilatometry, etc.

4.44 and 4.44a Industrial Metallurgy

A choice of several subjects from the following (not necessarily complete) list will be made:

1. Foundry techniques and control.
2. Electroplating and finishing.
3. Joining of metals, welding, brazing, soldering, etc.
5. Machinability.
7. Specifications and quality control.
8. Non-destructive testing, radiography, magnetic testing, etc.

Appropriate laboratory work will be carried out in conjunction with the lectures and a number of industrial visits will be made.

4.54 Metallurgy Seminar

A series of lectures on all aspects of the presentation of verbal reports and papers will be given. Then each student will deliver a paper on a technical subject chosen by himself. This will be followed by discussion of the paper and its method of presentation.
For engineering students who do not expect to practise metallurgy as a profession.


**Petroleum**—Properties, uses and testing of various products. Lubrication. Testing of lubricants and their suitability for various uses.

**Refractory Materials**—Bonding and fluxing. Shrinkage, porosity, thermal and electrical conductivity. Applications.

**Portland Cement**—Manufacture and setting.

**Laboratory**

The laboratory work consists of twenty-four experiments each of two hours duration. The work is done in groups of up to ten students under the supervision of a demonstrator. A short colloquium follows the completion of the experiments.

1. Pyrometry.
2. Foundry Technology I.
4. Bomb and gas calorimetry.
5. Solidification of alloys forming a Binary system.
6. Foundry Technology II.
7. The effect of grain size on the mechanical properties of metals.
8. Work hardening, recrystallization and grain growth.
10. Transformations in solid metals.
11. Solution treatment and precipitation hardening.
12. The effect of grain shape on miscellaneous properties of metals.
13. Corrosion.
14. Foundry Technology III.
15. Heat treatment of steel I.
17. Soldering and welding.
19. Heat treatment of steel II.
20. Coking of coal.
22. Porosity, heat conductivity and fluxing of refractories.
23. Metallurgical aspects of metal testing.
24. Flash point and viscosity.
MECHANICAL ENGINEERING

Subjects 5.00 to 5.95

5.101 ENGINEERING DRAWING AND MATERIALS

This course will consist of lectures on the elements of drawing office practice, and engineering materials and practice.


Plane Geometry—Parabola; ellipse; hyperbola; involute; evolute; cycloidal and trochoidal curves.

Descriptive Geometry—Projections; sections; oblique views; development of surfaces.


5.11 AND 5.11D ENGINEERING DRAWING

Instruction in the correct use of drawing instruments and the application of drawing standards. Measurements and dimensioning. Orthographic, isometric and dimetric projections. Lectures on engineering materials and practice, properties and uses of the common engineering materials.

In the drawing office the student will be required to do a reproduction on white paper to a scale of full size and to a reduced scale in orthographic projection of a machine part or simple assembly given to the student in isometric projection, and to do a tracing of this in ink on tracing paper. He will also be required to make fully dimensioned freehand drawings of five of the machine parts enumerated below and to make accurate detail drawings and/or assembly drawings from the freehand sketches as a basis.

Machine parts and elements—

Valves (stop, check, safety, gate).
Cocks (water, gauge, glass assembly, etc.).
Bearings (plummer block, oil ring, ball bearing, etc.).
Couplings (rigid, flexible, Oldham, Universal Joint).
Clutches (cone, disc, dog).
Pumps (gear type, semi-rotary, small piston pump).
Pistons (I.C. piston and piston rod assembly).
5.12 AND 5.12D MECHANICAL ENGINEERING DESIGN

Design procedures, loadings and factors of safety standards. Stresses in bolts. Design examples involving simple stresses. Design of shafts and bearings, belt drives and pulleys (leather, V pivot drives), friction clutches, springs and screws (for power applications).

Design work associated with the above will be carried out in the drawing office.

5.13 MECHANICAL ENGINEERING DESIGN

Design of gears (spur, worm), friction brakes (band, shoe), and load lifting appliances.

Design in the drawing office of a complete crane trolley.

5.13D MECHANICAL ENGINEERING DESIGN

This subject is a combination of 5.12 and 5.13.

5.14 AND 5.14D MECHANICAL ENGINEERING DESIGN

Design of a machine to a given specification. The types of machines to be designed will include:

- Air Compressor;
- High Speed Internal Combustion Engine;
- Gas Turbine.

Students will work in small groups on a number of assignments, the aim being to produce a technically sound and economical design.

5.21 AND 5.21D MECHANICAL TECHNOLOGY

Properties of Materials and their Principal Uses

Classification, definitions of properties.

Ferrous metals and alloys, heat treatment, non-ferrous metals and alloys, plastics, thermo-setting, thermo-plastics.

Tolerances and allowances, gauges, inspection, quality control, factory layout.

Machine Elements

Screw threads and screw fastenings, riveted joints, welded joints, keys and cotters, couplings, bearings, belt drives, chain drives, terminology in gear drives.

Degree students receive six periods of two and a half hours practical instruction on fitting, turning, shaping, milling and grinding.
5.211 AND 5.211A Workshop Processes and Practice

An introduction to some of the basic processes and practices of engineering workshops, to prepare students for the industrial training they must undergo as part of their courses. Students will attend lectures and demonstrations in some of the following fields, according to the courses in which they are enrolled. Instruction is given by the trade sections of the Department of Technical Education.

Fitting and machining, blacksmithing, heat treatment, founding and patternmaking, welding (oxy and electric), boilermaking, automotive mechanics.

5.22 AND 5.22D Mechanical Technology

Material Forming, Hot and Cold

Cold forming in presses: The structure of metals, punching and shearing, bending, bulging, necking, curling, deep drawing, extrusion, wire drawing.

Spinning, thread-rolling, cold heading and upsetting, wire-forming, die casting.

Hot rolling, forging, welding and flame cutting, technology of plastics, sand castings.

Single and multi-point tool theory, introduction to 5.23 Mechanical Technology.

5.23 AND 5.23D Mechanical Technology

Machine Tools

Lathes, centre-lathes, turret-lathes, single and multi-spindle.
Drilling machines, single and multi-spindle, tapping machines, boring mills, jig borers.
Planer, shaper, slotter.
Milling.
Broaching.
Gear generating.
Grinding, honing, lapping and superfinishing.
Measurement of surface finishes.
Polishing, plating and coating.
5.32 AND 5.32D ENGINEERING MECHANICS
(Principles of Kinematics and Dynamics)

1. **Fundamentals of Vector Analysis**
   Addition and subtraction of vectors; multiplication of a vector by a scalar; scalar product of two vectors; vector product of two vectors; differentiation of a vector with respect to time.

2. **Kinematics of the Plane Motion of a Particle (Fundamental Concepts)**
   Cartesian coordinates; polar coordinates; moving coordinates; relations between cartesian and moving coordinates.

3. **Kinematics of the Plane Motion of a Particle (Special Cases)**
   Rectilinear motion with constant speed; rectilinear motion with constant acceleration; simple harmonic motion; circular motion with constant speed; central motion; graphic methods of solution.

4. **Dynamics of the Plane Motion of a Particle (Fundamental Concepts)**
   Newton's Laws; force; mass; weight; momentum; work; potential energy; kinetic energy; strain energy; power; potential and dissipative forces; friction; efficiency; d'Alembert's principle.

5. **Unconstrained Motion of a Particle**
   The free fall; projectiles; the simple vibrating system; constant propelling force combined with a resistance proportional to the velocity; constant propelling force combined with a resistance proportional to the square of the velocity; orbital motion (Kepler's Laws); escape velocity.

6. **Constrained Motion of a Particle**
   The inclined plane; the pendulum; the conical pendulum, etc.

7. **Systems of Connected Particles**
   Inclined plane combined with pulleys; engine governor, etc.

8. **Dynamics of a Conglomerate of Particles**
   The linear momentum; time rate of change of linear momentum; internal forces; rocket propulsion; the water jet; angular momentum; time rate of change of angular momentum.

9. **Kinematics of the Plane Motion of a Rigid Body**
   Translation; rotation; general plane motion; instantaneous motion; velocity pole; centrodes; superposition of motions; relative velocity and acceleration of points on a rigid body.
10. **Moment of Inertia**
   Moment of inertia; centrifugal moment; principal axes; radius of gyration; Steiner's theorem.

11. **Dynamics of the Plane Motion of a Rigid Body**
   Linear momentum; time rate of change of linear momentum; impulse; angular momentum; time rate of change of angular momentum; rotational impulse; unconstrained and general constrained plane motion; rotation about a fixed axis; the central straight impact; conservation of momentum; coefficient of restitution; d'Alembert's principle; centre of percussion; determination of reactions by d'Alembert's principle; replacement of bodies by equivalent point masses; work and power in rotational motion; kinetic energy of a body having general plane motion.

12. **Kinematics and Dynamics of the Relative Motion**
   Relative motion of unconnected points; moving reference frames; Coriolis acceleration; Newton's law and d'Alembert's principle; deviation.

13. **The Free Motion of a Rigid Body**
   Principal axis; conservation of angular momentum.

14. **The Gyroscope**
   The principal theorem (consideration of momentum, consideration of Coriolis forces); applications.

15. **Kinematics of Mechanisms**
   Instantaneous centres; velocity diagrams; acceleration diagrams.

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**5.33 AND 5.33D THEORY OF MACHINES**

A. **Velocity and Acceleration**
   Diagrams of mechanisms with triple-paired floating links.

B. **Cams**
   1. Determination of cam profiles to satisfy given conditions.
   2. Analysis of given profiles.
   3. Determination of cam-springs.

C. **Determination of Flywheels for I.C. and Steam Engines, Compressors, Presses, etc.**

D. **Engine Governors**

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E. Balancing
1. Rotating masses.
2. Reciprocating masses.

F. Toothed Gearing
1. Conditions for constant velocity ratio.
2. Involute gearing—standard and corrected gears.

G. Gear Trains
Simple, compound, epicyclic.

5.33A Theory of Machines

A. Vibrations

B. Balancing of Rotating Masses

C. Gearing
Friction drives; velocity ratios of gear-trains. Condition for constant velocity ratio-conjugate profiles. Involute of circle as gear profile. Involute function; tooth thicknesses at different radii; cutter settings, gears at non-standard centres.

D. Cams.

5.34 and 5.34D Theory of Machines

A. Inertia Effects in Mechanisms
Bending of members, forces in joints.

B. Mechanical Vibrations
As for 5.33A, Part A.

5.41 and 5.41D Descriptive Geometry

Plane geometry; ellipse, parabola, hyperbola, involute, cycloid and other curves.
Fundamental concepts of descriptive geometry, including reference systems, representation of point, line and plane; fundamental problems of position, of perpendicularity and of measurement.
Construction of curves from plane geometry. Various surfaces and solids, their sections, developments and intersections in solid geometry. Application of descriptive geometry to certain problems arising in engineering practice. Special emphasis on ability to visualise problems and processes involved in their solution.

5.52 AND 5.52D FLUID MECHANICS

Historical development and present day scope of subject. Physical properties of fluids.


Momentum equation. Forces on bends, fixed and moving vanes. Impulse turbine. Moment of momentum equation and its application to reaction turbines, centrifugal pumps and fans.


Elementary problems of unsteady flow. Orifice discharging under falling head. Discharge of reservoir through pipeline.


5.53 AND 5.53D FLUID MECHANICS


Drag. Pressure drag and friction drag. Drag at small and large Reynolds numbers and in a non-separating flow. Boundary layer mechanics. Separation. Skin friction drag of a thin plate (a) laminar, (b) turbulent, (c) transition from laminar to turbulent boundary layers. Resistance of, and pressure variations around bodies of revolution. Influence of a free surface.


5.54 and 5.54d Fluid Mechanics


5.703 MECHANICAL ENGINEERING

A course for students in Chemical Engineering and Food Technology.

(a) Vibrations


(b) Balancing of Rotating Masses

(c) Thermodynamics

An elementary treatment of selected topics from 5.72 Thermodynamics, and the Refrigeration section of 5.74 Thermodynamics.

5.72 AND 5.72D THERMODYNAMICS

Introduction and Gas Laws

Heat engines; working substance; perfect gas; measurement of pressure, volume and temperature; gas laws; characteristic equation; gas constants; the lb.-mole.

Forms of Energy, Power

Measurement; internal energy; work; heat and modes of transfer; first law of thermodynamics; Joule's equivalent power; I.H.P.; B.H.P.; common units of work and power; steady flow equation.
**Simple Energy Equation**

Heat calculations; specific heats of a gas; simple energy equation; work done in change of state ($\int PdV$). Joule's law; internal energy of a perfect gas; relation between $C_p$, $C_v$ and R.

**Enthalpy and Entropy of Gases**

Definitions; reversibility; $T = \frac{\partial S}{\partial Q}$ diagrams; change of entropy in terms of $P$, $V$ and $T$.

**Gaseous Mixtures**

Partial pressures of constituents; equivalent gas constant, molecular weight, and specific heats of a mixture; conversion from volumetric to gravimetric analysis.

**Thermodynamic Processes**

Constant volume, constant pressure and isothermal operations for a gas. Isentropic and polytropic operations for a gas. Effect of varying “n” in polytropic equation $PV^n = K$.

**Compressed Air**

Uses of compressed air; power transmission by compressed air; types of compressors; work done in reciprocating compressors. Clearance volume; volumetric efficiency; multi-stage compression; conditions for minimum work; compressor efficiencies; air motors.

**Heat Engine Cycles**

Essentials of a heat engine; definition of a cycle; ideal and actual cycles; Carnot cycle for a gas; second law of thermodynamics.

**Internal Combustion Engine**

Classification; air standard cycles (in terms of temperature only); effect of compression ratio on air standard efficiency. Two-stroke and four-stroke cycles; typical indicator diagrams for all types; carburation, ignition and fuel injection (briefly). Comparison of petrol and compression ignition engines. Performance figures. I.C. engine fuels and their properties (briefly).

**Formation and Properties of Steam**

Definition of a vapour; formation of steam at constant pressure; properties of liquid, wet, dry and S/H steam. Enthalpy, specific volume and internal energy. Use of steam tables; determination of dryness fraction; entropy of water-steam; $T = \frac{\partial S}{\partial Q}$ diagram for water-steam.

**Steam Boilers**

Purpose; classification; examples and application of water-tube and fire-tube boilers; essential fittings.
Boiler Auxiliaries (brief treatment)
Economizer; air pre-heater; draught equipment; superheater; firing methods.

Boiler Performance
Equivalent evaporation; boiler efficiency; boiler heat losses (briefly); heat accounts.

Steam Engine Cycles
Carnot cycle for a vapour; Rankine cycle of operations; Rankine cycle using wet, dry and superheated steam on $T$—$S$ diagram; Rankine efficiency in terms of (a) areas, (b) enthalpies.

Steam Engine Plant
Essentials of a steam plant; simple reciprocating engine construction and operation; valve gear (briefly); indicator diagrams.

Steam Condensers
Purpose; surface and jet types; auxiliaries; cooling water calculations; effect of air; partial pressures of air.

Steam Turbines
Principles; advantages; turbine nozzles; calculation of velocity; impulse and reaction turbine.

Gas Turbines
Principles; ideal cycle of operation; layout of simple open cycle plant (showing typical pressures and temperatures); performance and application.

5.73 AND 5.73D THERMODYNAMICS

Heat Transfer
(a) Conduction of heat—Dimensions of, and factors influencing, conductivity: steady state conduction through homogeneous and composite walls, cylinders, etc.; variable conductivity; general equation for conduction in unsteady state (reference to steady state as a special case).
(b) Convection—Nature, and investigation by dimensionless analysis; main dimensionless groups; free and forced convection; empirical equations for flow of fluids through pipes.
(c) Combined Conduction and Convection—Examples; heat transfer between fluids separated by composite and homogeneous walls; type of heat exchanger; Log. mean temperature difference for various heat exchangers.
(d) Radiation—Concept of black body; Kirchhoff’s law; Stefan-Boltzmann law; emissivity and absorptivity; heat exchange between parallel planes.

(e) Heat Flow with All Three Methods Operative.
   Revision of Energy Equations and Thermodynamic Processes.

I.C. Engines—General

Review of air standard cycles and efficiencies—effects of compression ratio and permissible pressure on A.S.E. Effects of dissociation and variable specific heats. Calculation of cycle temperatures and efficiencies; use of Hottel charts.

I.C. Engines—Gas and Petrol Engines


I.C. Engine—Oil Engines

Hot bulb type; semi-diesels; two- and four-stroke diesels; air-blast and solid injection; governing; process of combustion; diesel knock; effects of mixture strength and compression ratio.

I.C. Engines

Various efficiencies; performance curves; heat accounts.

Vapour Processes and Cycles

Constant pressure, constant volume, isothermal and isentropic processes; throttling process; adiabatic equation; Mollier chart; Carnot cycle; Clapeyron’s equation; Rankine cycle (wet, dry and superheated steam); heat drop; feed pump energy; thermal efficiency. Ideal regenerative cycle; application to compound steam engines; general expression for thermal efficiency with multi-stage bleeding; the repeat cycle; applications and advantages.

Steam Engines

Hypothetical and actual indicator diagrams; diagram factor; indicated steam consumption; missing quantity; actual behaviour of steam in cylinder. Simple and multiple expansion engines; compounding; cylinder dimensions; power control by throttling and cut
off; combined indicator diagrams. Difference between actual and Rankine efficiency; improvement of relative efficiency; performance curves; heat accounts.

**5.74 AND 5.74D THERMODYNAMICS**

**Binary-fluid Cycles**

Extension of temperature range in heat engines (mercury-steam, diesel-steam, diphenyl oxide-steam); analysis of cycles; applications and performance.

**Nozzles**

Purpose and types; critical pressure and sonic velocity; nozzle friction; supersaturation; determination of nozzle dimensions for gas and steam flow.

**Steam Turbines**

Types and methods of compounding; calculation of force, work and horsepower from velocity diagrams; blade and stage efficiency; blade friction; repeat factor; internal efficiency. Multi-stage diagrams (impulse and reaction turbines). Drum and blading dimensions; types of blading. Improvement of turbine efficiency; application and performance of turbines.

**Gas Turbines**

Development; constant volume and constant pressure cycles; ideal thermal efficiency of simple cycle; effect of heat recovery; adiabatic efficiency of compressor and turbine; effects of burner losses, variation in specific heats, pressure drops in system, mechanical losses and heat exchanger performance.

Expression for plant thermal efficiency taking account of all losses; conditions for (i) zero output and (ii) maximum output with fixed temperature limits. Polytropic efficiency; methods of improving output and thermal efficiency; examples of actual cycles, open and closed.

Description of components; applications and performance.

**Refrigeration**

Principles and definitions; reversed Carnot cycle; cold air machines; vapour compression refrigeration; conditions for maximum C.O.P.; nature and use of Mollier diagrams and Pressure-Enthalpy charts.

Absorption refrigeration—ideal and actual coefficients of performance; industrial and domestic applications.

Properties and applications of common refrigerants.
Refrigerator tests and heat accounts.
Heat pumps—theory and applications.

**Psychrometry**

Application of gas laws and Dalton's law to air-water vapour mixtures; relative and specific humidity; dew point; enthalpy of air-vapour mixtures; adiabatic saturation and wet-bulb temperature. Psychrometric chart; application to simple problems.

### 5.91D Naval Architecture I

**Theory and Calculations**


**Ship Construction**

Short history of evolution of ship types. Classification of vessels into types. Principal features and arrangements. Equipment.

Arrangements and details of building berths. Shipyard equipment. Materials used in ship construction.

Details of ships’ bottom structure. Midship section. Riveted and welded connections.

Details of construction of small wooden vessels.

**Mould Loft**


### 5.92D Naval Architecture II

**Theory and Calculations**


Preparation of full set of hydrostatic curves.

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Ship Construction


Mould Loft


5.93d Naval Architecture III

Theory and Calculations


Ship's Structure

Preparation of midship section, profile and decks plans to requirements of Lloyd's.

Strength of bulkheads, beams and pillars. Strength of riveted and welded connections.

Arrangements of rigging and lifting appliances. Strength of derricks, derrick posts, masts and rigging.

Launching Theory and Practice


5.94d Naval Architecture IV

Ship Construction, Part A

Longitudinal strength calculation for a given vessel and loading.
Shear stresses.
Strength of plating.

Ship Construction, Part B


Ship Resistance and Propulsion


Ship trials. Analysis of trial data.

Ship Design

Methods for estimating and calculating weights of ship. Use of coefficients. Methods for recording data. Preparation of lines plan from given dimensions and curve of areas.

Type of marine prime movers. Comparison on basis of weight, size, efficiency, first cost, life, running costs, reliability and flexibility, etc. Auxiliary machinery.

5.95d Naval Architecture V

Ship Building Practice


Ship Design


Suitability of arrangements for various types of service.

Accommodation. Government and Registration Society regulations affecting strength, accommodation, life-saving, fire fighting, lights, signals, etc. Cargo handling. Ships’ equipment.


Design of a vessel from a brief specification. To determine dimensions, lines, hydrostatic curves, Lloyd’s midship section and structural profile, estimate of stability and trim, freeboard, tonnage, power of prime mover, propeller design and general arrangement.

Ship Construction


Historical review of tonnage. Tonnage regulations—British, Suez Canal and Panama Canal. Use of regulations.

ELECTRICAL ENGINEERING

Subjects 6.00 to 6.95

6.104 ELECTRICAL ENGINEERING

A course of lectures, laboratory and design work in electrical engineering which is common to Options 1, 2 and 3 and including a study of measurements, electron physics, illumination, servomechanisms, electric circuit and field theory and electronics.

6.113 ENGINEERING PRINCIPLES (Honours)

Material will be selected from the following topics:

Engineering differential equations; Laplace transform solution; complex variable; generalised feedback theory, signal flow; stability criteria; statistical methods including analysis and synthesis of noise; analogous systems, system simulation.

6.114 ELECTRICAL ENGINEERING (Honours)

Material will be selected from the following topics:

Machine matrix equations; the primitive electrical machine; root locus applications; signal flow; pulse techniques, sampled data; analysis of linear and non-linear systems containing noise; information theory; circuit synthesis; applications of electro-magnetic theory.

6.12 AND 6.12D ELECTRIC CIRCUIT THEORY


Electrostatic and Electromagnetic


**Alternating Current.**

**6.13 (6.13a and 6.13b) Electric Circuit Theory**

**Three-Phase Circuit Analysis**—Symmetrical and unsymmetrical sources, balanced and unbalanced loads. Three-phase power measurement. Harmonics in three-phase systems.

**General Network Theory**—General $n$ mesh network, general star-mesh transformation.

**Transient Responses** of circuits with lumped parameters (Laplace transform treatment).

**Four Terminal Network Theory**—Transfer impedance and admittance equations.


**Calculation of Transmission Line Parameters**—Eddy current loss, skin effect, proximity effect.

**Maximum Power Transfer**—Impedance matching.

**Wave Filters**—Constant $K, m$ derived.

**6.214 Power Systems**
A course of lectures, laboratory and design work relating to the performance of power systems under steady load and fault conditions.
6.224 Electrical Machines

A course of lectures, laboratory and design work covering the aspects of machines and transformers necessary for the study of such equipment as components of power systems.

6.23 (6.23A AND 6.23B) Electric Power Engineering

This subject is an introduction to the principles of operation of transformers and rotating machines used for the conversion of mechanical to electrical energy and vice versa and the transmission of energy between the points of conversion.

The emphasis will be on the principles involved in the steady state operation of the equipment.

D.C. Machines


Transformers


A.C. Machines

General—Generation of three-phase e.m.fs. with distributed conductors and sinusoidal space distribution of field flux.

Rotating m.m.f. with assumption of sinusoidal space distribution of coil m.m.f.

Synchronous Machines

Armature reaction and synchronous reactance. Relation between excitation and power factor in generators and motors. Power angle and torque. Starting and synchronising.

Induction Machines

Production of torque. Equivalent circuit and circle diagram. Effect of rotor circuit parameters on speed control and starting characteristics. Induction generator.

Single-Phase Motors

Induction type: Theory of operation, construction, methods of starting, split phase, capacitor motors.
Commutator type: Theory of operation, construction, compensating windings, interpoles. Motor with series and shunt characteristics, applications.

Rating of Equipment
Losses and efficiency. Cooling of electrical equipment.

Protection and Control Devices

Transmission
Introduction to transmission of power neglecting shunt impedance, regulation and efficiency.

6.234 Utilization and Control of Electrical Plant
A course of lectures, laboratory and design work relating to the utilization and control of electrical equipment. It includes a study of transformers and induction, synchronous and commutator machines with particular reference to industrial equipment and machines and apparatus used for automatic control.

6.303 (6.303A and 6.303B) Electronics
Escape of electrons, work function, properties of common cathode materials, temperature-limited and space-charge-limited current flow. The static characteristics of a diode and triode, the construction and use of a loadline. The equivalent circuits of a triode.

Gas discharges, gas-filled diodes, thyatrons, description of mercury arc rectifier.

Single-phase rectifiers, smoothing.

Class A amplifiers, distortion, frequency response with R-C coupling, Miller effect, other types of interstage coupling network.

Secondary emission, tetrode and pentode.

Class A power output stages, optimum load, efficiency, frequency response. Class AB and Class B output stages, optimum load, efficiency, distortion.

Feedback negative and positive; effect on gain, distortion, frequency response, input and output impedances.


Class C amplifiers, calculations, neutralising.
Semi-conductors, semi-conductor diodes, types of transistor, static characteristics, equivalent circuits, grounded base, grounded emitter and grounded collector amplifiers, transistor oscillators, biasing arrangements.


Propagation of radio waves, ionospheric reflection.

6.304 (6.304A AND 6.304B) INDUSTRIAL ELECTRONICS AND CONTROL
A course designed to link electronic and electric power in engineering and various other branches of engineering and science in the minds of students, and to give advanced students composite projects involving many aspects of what they have learnt together with economic and practical aspects.

Section A—Regulators and servomechanisms, dynamics of closed systems, industrial control problems.

Section B—Induction heating, dielectric heating.

Section C—Selection of topics such as—
Polyphase rectifiers;
Electronic control of motors and generators;
Basic timing circuits;
Ignitions and thyratrons as line switches;
Resistance-welder controls;
Industrial X-rays;
Photoelectric devices, electronic lamps;
Electrostatic precipitation;
Power line carrier.

6.314 RADIO COMMUNICATIONS
A course in the theory, design and operation of equipment and materials used in radio transmission and reception for communications and entertainment, and of the characteristics of the medium through which transmission takes place.

6.334 LINE COMMUNICATIONS
A course in the theory, operation and design of equipment and materials used in the transmission of information over lines and cables, and of the characteristics and composition of the various types
of transmission lines which are used. Subject matter common to that in Radio Communications will normally be dealt with in the latter course.

6.344 APPLIED ELECTRONICS

A course of lectures, laboratory and design work covering the principles of electronic engineering relative to automatic control and industrial processes.

6.83 AND 6.83D ELECTRICAL ENGINEERING

A special course for metallurgists and for engineers not intending to follow electrical engineering as a profession. Presentation of the fundamental principles of electric and magnetic circuits and the application of these principles to the theory and performance of direct and alternating current machines.

Lighting systems and illumination, wiring code, safety precautions.

6.84 AND 6.84D ELECTRICAL ENGINEERING

More advanced work following 6.83 on the operating characteristics of motors. Controller design and application, including types, methods of acceleration and retardation, protective devices. Essentials of connecting motor to load. Principles of moving fluids and solids. The application of motors, electron tubes and photo-electric cells.

6.94 ELECTRICAL ENGINEERING

This course consists of one hour lecture and two hours laboratory per week for an entire year. Half of the course is devoted to detailed mathematical and descriptive study of electric and magnetic circuits. The other half of the course will provide an introductory course on transformers, motors, generators and electronics.

6.95 ELECTRICAL ENGINEERING

This course consists of two one-hour lectures and three hours laboratory per week for an entire year. Half of the course is devoted to detailed mathematical and descriptive study of transformers, motors, generators, wiring practice and electrical measurement. The other half of the course is devoted to electronics and special applications of electrical engineering to chemical plant. This section of the course will be given by various specialists. The following subjects are examples of its coverage:

Thermionic tubes; conduction of electricity through gases; rectifiers; rheostats; magnets; electric furnaces and electroplating; power generation and distribution.
Electrical Engineering Graduate Course Subjects

6.105  **Advanced Mathematics**

A course of study of advanced mathematics relevant to electrical engineering and in particular, automatic control systems. It will include a selection of topics from the following:

- Laplace transforms.
- Fourier transforms.
- Matrix algebra.
- Functions of a complex variable.
- Stability criteria.
- Boolean algebra.
- Statistics.
- Calculus of variations.
- Non-linear analysis.

6.305  **Feedback Control Systems 1**

*Linear System Theory*

Response of linear mechanical or electrical systems

Block diagrams and transfer functions for open loop and closed loop.

- Complex plane plots. Bode diagram.
- Root-locus diagram.
- Stability and performance criteria.
- Corrective networks.
- Qualitative treatment of common non-linearities.
- Phase plane diagram.

*Components*

- Amplifiers.
- Error sensing devices.
- Reference sources.
- Power elements.
- Use of self-heating valves.

*Systems*

- Principles of system design.
- Description and analysis of a variety of actual feedback control systems.
Measurements
Measurement of characteristics of components.
Calculation of transfer function from measured data.
Measurements on systems. Signal generators.
Measurements at very low frequencies.
Methods of plotting time and frequency response.

Tutorial Periods
Laboratory
A comprehensive course of experiments designed to illustrate the principles and practices outlined in the lecture work.

6.306 Feedback Control Systems II
A continuation of the work in Feedback Control Systems I with special reference to A.C. servos, relay servos, non-linearities in systems and components, and sampled data systems. Associated tutorial and laboratory work.

6.315 Computers
Although this course will cover general methods of computation, emphasis will be placed upon electronic analogue computers since UTAC will be available for practical work.

Basic methods of computation (mechanical, electro-mechanical, electronic, etc.).

The design and use of analogue computers.
The solution of linear equations.
Methods of solving non-linear equations, and equations with varying coefficients.
The electrolytic tank and other miscellaneous techniques.
A study of digital computers including the elements of programming.

6.325 Communications I
Fundamentals of Information Theory.
Modulation.
Noise and random signals, correlation techniques, treatment by spectral densities, response of non-linear systems, sources of noise, characteristics, measurements.
Synthesis and realization of networks.
Pulse circuitry.
Associated tutorial and laboratory work.

6.326 COMMUNICATIONS II
A continuation of the work in the first year of the course with emphasis placed on the engineering use of the principles studied therein.
Associated design and laboratory work.

6.335 GRADUATE ELECTIVE
The elective to be offered in 1959 covers work in high frequency fields.
Revision of fundamentals, Maxwell's equations, scalar and vector potential, Hertzian vectors, etc.
Basic principles of guided and free space propagation.
Antenna theory.
Field, impedance and related measurement techniques for VHF and microwaves.
Space charge fields, related concepts—solid state physics.
The electrolytic tank and analogue computer as aids to computation in this field.
Associated tutorial and laboratory work.
MINING ENGINEERING AND APPLIED GEOLOGY
Subjects 7.00 to 7.934 and Geology (Science)

7.012 MINING I

Introductory course in mining processes and practice.


7.013 MINING II

(a) Methods of Working Coal

Proving the deposit; general outline of development; equipment used. Shaft mountings and insets; location; factors affecting location; structure. Pit bottom; excavation; support; layout. Development of coal seams; order of extraction; methods employed; horizon mining. Bord and pillar workings; suitable conditions; size of pillars; typical layouts and machines used; pillar extraction. Longwell working; suitable conditions; layouts and machines used. Methods of working in special cases; steep seams; thick seams; seams in close proximity; seams subject to spontaneous combustion. Roof supports; at the face and on roadways. Hand, hydraulic, pneumatic and mechanical stowage. Caving. Withdrawal of supports. Preservation of timber supports.

(b) Methods of Working Metalliferous Deposits


(c) Mine Atmospheres and Dust Control

Atmospheric conditions in mines. Sources of pollution of mine air; mine gases; properties and physiological effect of various gases; sampling of mine air; air analysis; detection of gases, gas detectors.

Temperature and humidity; their causes; geothermic gradient; physiological effect of temperature and humidity; kata thermometer; effective temperature; conditioning of mine air; hot and deep mines. Environmental surveys.

Miners’ diseases; silicosis; pneumoconiosis; nystagmus; sporotrichosis; ankylostomiasis; dermatitis. Compensation and treatment.

Dust formation. Dust prevention:—Boring; cutting; loading; travelling roads; ore bins and shutes; screens. Air cleaning. Dust extraction. Dust measurement, sampling and analysis.

(d) Spontaneous Combustion Explosions

Oxidation of coal; historical review of theories of cause of spontaneous combustion; factors influencing self-heating; observation and organisation in seams liable to spontaneous combustion; detection of incipient heating.

Methods of dealing with heatings and gob fires; removal of fires; construction of seals.

Layout of workings in seams liable to spontaneous combustion. Re-opening of sealed-off areas.

Ignition of gas and coal dust; explosive properties of coal dust; factors affecting explosibility; nature and characteristics of gas and coal dust explosions; causes, effects and precautionary measures; research work on gas and coal dust explosions.

(e) Fires, Rescue, Recovery

Other causes of underground fires; precautions and methods of dealing with fires.
Sources of water under pressure; precautionary measures when working under or approaching water; water blast; dams.

Rescue work; respiration; self-contained breathing apparatus; smoke helmets and respirators; organisation and operation of rescue work; rescue stations and brigades; mine accidents; ambulance stations and organisation.

7.014 MINING III

(a) Mining Methods, Strata Control, Subsidence, Rock Bursts

Advances in mining methods, discussions on mining engineering problems.

Subsidence, Strata Control, Rock Bursts

Subsidence; early theories, angles of draw, surface movements, influence of thickness of seam, depth, inclination of strata, nature of strata, methods of working, etc. Shaft pillars and pillars for other surface supports.

Properties of coal measure rocks.

State of stress at mining depths; the stress conditions in the vicinity of single and multiple roadways and their effects.

Stress conditions along pillar extraction lines in bord and pillar mining.

Principal stress conditions in longwall mining and their effects; means of modifying excessive stress conditions.

Rock bursts in mines; theories; classification; conditions conducive to bursts; examples of rock bursts; preventative measures.

(b) Sampling, Valuation and Marketing

Sampling and Valuation—Review of statistical theory with extensions to cover pertinent aspects of sampling technique. Methods of face and borehole sampling—“weighting” of results. Treatment of erratic high assays. “Salting”; assay plans. Factors in mining operations which determine annual profits and duration of production. Determination of present values by single and multi-rate formulae.

Marketing—Mineral beneficiation, extractive metallurgy. Smelter schedules. Marketing of minerals, prices, points of sale, effect of impurities, mineral resources.

(c) Management Theory, Company Law, Work Studies

Management organisation, duties, function and responsibility of officials, reports, returns, notices.
Labour control, time keeping, measurement of work, efficiency engineering studies, systems of payment, labour turnover.

Industrial relationships, trade unions and associations. Economics of New South Wales coalfields.

Company formation, types of companies, company law, methods of finance, capital, shares, company expansion, absorption or amalgamations.

(d) Mine Organisation, Mine Management


(e) Law

N.S.W. Mining Act, 1906-1952.

N.S.W. Coal Mines Regulation Act, 1912-1952.

N.S.W. Mines Rescue Act.

7.022 Mining Engineering I

Drilling—Types of drills; hammer drills, power drills, rotary, hydraulic rotary drills, churn drills. Method of mounting and the operation of the drilling machine, wet drilling and dry drilling. Drill steel and drill bits, method of sharpening drill bits, drill shop organisation and drill steel distribution. Drill rounds, depth of hole, selection of drilling method to be used, comparisons of efficiency and cost.


Explosives and Blasting—Action of explosives; types of explosives, composition and classification of explosives. Permitted explosives; tests of explosives; choice of explosives; sheathed explosives; storage of explosives. Detonators; charging and firing shots; gases due to shot firing; multiple shot firing. Exploders; arrangements of shot-holes in coal and stone. Substitutes for explosives.
Shaft Sinking—Preliminary considerations; selection of site, determination of number, size and shape of shafts; ordinary methods of sinking and lining shafts; appliances and accessories required.

Shaft sinking in difficult conditions; special methods of sinking, enlarging, repairing and deepening shafts. Surveying shafts. Large diameter boreholes. Development of shaft stations.

Ventilations and lighting of shafts; dealing with water from shafts.

Construction of head frames.


7.023 Mining Engineering II
(a) Mine Ventilation, Transport, Winding, Drainage

Mine Ventilation—Quantity of air required for ventilation; measurement of quantity and pressure of air; resistance to flow of air.

Ventilation laws; their evolution and application; equivalent orifice; motive column; evasee chimney; air distribution in mines; splitting air currents; regulators. Methods of producing ventilation; brief historical review; natural ventilation; description and characteristics of centrifugal and axial flow fans. Main and auxiliary ventilation; ventilation surveys.


(b) Power and Compressed Air

Power Supply and Transmission—Fundamental principles of electric and magnetic circuits and the application of these principles to the theory and performance of direct and alternating current machines.

Surface Installations at Mines—Distribution of power; substations; electric winding engines; straight A.C. system, converter equalizer system, Ward Leonard system, Ilgner system, C.M.B. system, Cascade motor system; ventilation fan motors; other surface plant; bare overhead transmission lines; rectifiers; surface lighting. Lamp room equipment.


Compressed Air—Air compression, types of compressors; receivers; transmission lines; pressure drop in lines; air meters; application and air consumption of various types of air motors.

(c) Mine Design

Design of underground supports, transport systems and lay-outs. Winding headframes and ancillary equipment. Ore bin design and other selected design projects.

7.034 AND 7.034D MINERAL DRESSING

Object, scope and economics of coal preparation and mineral dressing.


Liberation—Theory and effect on concentration procedures, use of mineragraphy.

Sizing—Laboratory sizing and industrial screens.
Theory of Classification—Classifiers; coal washing machines which operate on classification principles.

Coal Preparation—Distribution of ash in coal; float and sink tests; washability curves; jig and trough washers; float and sink separators; cyclone separators; spiral concentrators; froth flotation; pneumatic separators.

Mineral Dressing—Sink and float; jigging; flowing film concentration; flotation and agglomeration; spiral concentrators; magnetic separators; electrostatic separators; amalgamation; cyanidation; recovery of metal from ores.

Storage—Conveyors, weighing; sampling; feeding; thickening; drying; filtering; pumping; tailings disposal; centrifuges; dust collection.

Marketing—Sale of products; smelter schedules.

Flowsheets—Mill design; pilot plants.

Laboratory—Principally work on—

(a) Sampling.
(b) Mineragraphy.
(c) Size reduction, crushing, grinding and screening.
(d) Separation.
   (i) Coal preparation.
   (ii) Mineral concentration.

7.054 AND 7.054D ASSAYING

Fire Assaying—Determination of gold, silver, tin and elements of the platinum group.

Qualitative Analysis—The identification of elements and some radicals by the methods of group separations in solution. Class demonstration of chromatographic techniques.

Blowpipe Analysis—Quantitative determination of the principal elements occurring in minerals, with particular reference to the techniques of blowpipe analysis which may be adapted to field conditions.

Quantitative Analysis—The theoretical principles of quantitative analysis, both gravimetric and volumetric. A systematic study of selected conventional analytical procedures for ores and minerals of interest to the mining engineer and geologist, including iron, lead, zinc, nickel, cobalt, manganese, tin, copper, silicates, waters, mine and flue gases, proximate analysis of coal, etc. Colorimetric analysis.
Laboratory
Selected exercises from each of the abovementioned sections of the theoretical course.

7.502 GEOLOGY
Introduction, the scope and applications of geology; cosmology and structure of the earth; agents of denudation, weathering, river action, glaciology, wind action, the sea and its action, lakes; underground water, diastrophism, vulcanism and earthquakes; igneous, sedimentary and metamorphic rocks, coal and petroleum.

Laboratory
Examination and identification of common minerals and rocks in hand specimen; interpretation and preparation of geological maps and sections.

Field Work
Six excursions to be held on Saturdays during the year.

7.503 (7.503A AND 7.503B) PETROLOGY
Forms and structures of igneous rocks; physical chemistry of rock-forming minerals; consolidation of magmas; variation in igneous rocks; classification of igneous rocks; petrographic methods; alkaline rocks and their origin; petrographic provinces; ultramafic rocks, origin and mode of emplacement of bathyliths.

Thermal, regional and plutonic metamorphism; facies concept in metamorphism; metasomatism.

Composition and classification of sedimentary rocks; sedimentary environments; physical properties of sedimentary rocks; facies concept in sedimentation; tectonism and sedimentation; palaeogeographic mapping.

Laboratory
Microscopic examination of minerals and rocks. Introduction to petrographic methods.

7.504 ADVANCED PETROLOGY
A specialised study of petrology, designed to include important current developments, and covering the following:

Instruction in the use of the universal stage; introduction to the study of petrofabrics.

Application of petrological methods to the study of industrial raw materials; mineralogy of artificial minerals, cements, slags, ceramics and refractories; optical determination of artificial minerals.
Laboratory

Practice in the use of the universal stage, petrofabric investigations; thin section examination of artificial minerals found in ceramics, refractories, slags and cements; differential thermal analysis and its applications.

7.511 Introductory Geology and Mineralogy

Elementary descriptive and determinative mineralogy. Common rock-forming and economic minerals. The main division of rocks and their lithological and structural characters.

7.512 Mineralogy and Crystallography


Introduction to the atomic structure of crystals; Bravais lattices; examples of the atomic structure of some common minerals. Introduction to chemical crystallography; isomorphism, polymorphism, etc. Physical properties of crystals; cleavage, gliding, secondary twinning. Introduction to crystal optics in polarised light. Theory of crystal growth; vicinal pyramids etching and corrosion figures. Hardness and specific gravity of minerals and their accurate determination. Classification of minerals. Descriptive mineralogy of the more common minerals, especially economic minerals.

Laboratory

Exercises in crystal symmetry; optical goniometry. Crystal drawing from projections. Crystallographical calculations. Examinations of crystal sections by means of the polarising microscope in transmitted light, both parallel and convergent. Determination of the refractive indices of minerals by various methods. Determination of specific gravity. Macroscopic examination of the more common minerals, including simple physical, optical, chemical, etc., tests. Study of the paragenesis and mode of occurrence of minerals. Blowpipe analysis of minerals.
7.313 Advanced Mineralogy

Systematic treatment of the thirty-two crystal classes on the basis of the Hermann-Mauguin classification.

Advanced sections of crystal optics; the universal stage; physical properties of crystals (elasticity, electrical, thermal) with a view to their technical applications.

Atomic structure of crystals; point groups, space groups. Introduction to the principal methods of X-ray investigations of crystalline materials.

Selected chapters of descriptive mineralogy (radio-active minerals, rare-metal minerals) discussed on the basis of the fundamental laws of crystallochemistry and geochemistry.

Laboratory

Advanced methods of investigation of crystals in polarised light, both parallel and convergent. Methods of the universal stage. Double variation method for the determination of the refractive index in oriented grains.

X-ray analyses of crystalline matter by means of the powder method. Selected problems of determinative mineralogy, including microchemical methods.

7.523 (7.523A and 7.523B) Stratigraphy and Palaeontology

Principles of stratigraphic geology. Introduction to stratigraphy of North West Europe. The geological evolution of the Australian continent from Pre-Cambrian to Recent times.

Invertebrate palaeontology; systematic classification of the various phyla and detailed morphological study of the important subdivisions of the phyla; an outline of historical geology. Regional palaeontology; stratigraphical significance of fossil assemblages. Stratigraphical correlation of sedimentary strata; palaeontological environment and its relationship to sedimentology, ecology, evolutionary trends; statistical palaeontology.

Practical

Examination and description of representative fossils from the various phyla; study of fossil assemblages.

Structure contour exercises, interpretation of structure and history from geological maps.
7.524 **PALAEOLOGY**  
(See Geology III (Science) below.)

7.533 (**7.533A AND 7.533B**) **ECONOMIC GEOLOGY**


Structural control of ore deposition—local and regional.

Paragenesis, oxidation, enrichment.

Macro and micro textures of the ore mineral. Metallogenic epochs of Australia. Study of selected paragenetic mineral groups; metals in industry.

Study of principal Australian and overseas ore deposits.

**Laboratory**

Study of a wide range of ore types. Vein structures, wall rock alteration phenomena. Microscopy of the opaque and non-opaque ore minerals. Examination of suites of ores and country rocks from important Australian and overseas localities. Spectrographic studies of the ore minerals.

7.534 **MINING GEOLOGY**


**Practical**

Mapping problems, study of mine plans and mine models. Literature survey concerning old workings and the assessment of possible further production using specific examples. Preparation of geological reports based on actual field studies.

7.543 **GEOPHYSICS**

An introduction to the basic principles of geophysics, and to the principles, methods and applications of geophysical exploration, viz., gravity, magnetic, electrical, seismic, radioactive, and miscellaneous. Discussion of various physical properties of rocks.
7.553 GEOLOGY OF FUELS


Coal measure flora. Type and rank variation.

Petrology of coal. Chemical constitution of coal and its relations to type and rank. Study of principal Australian and overseas coal fields.

Laboratory

Problems in correlation—lithological and palaeontological.

Chemical and fluorimetric analyses. Study of petrolierous sediments. Visits to oil refineries.

Micropetrology of coal. Analyses of coal.

Determination of trace elements in coals.

7.564 PHOTOGRAMMETRY AND PHOTOGEOLOGY

A short course in the principles of photogrammetry and the use of stereographic mapping instruments. Application of photogrammetry in geological mapping. An introduction to the interpretation of aerial photographs for geological purposes.

7.574 ENGINEERING GEOLOGY


7.584 STRUCTURAL GEOLOGY

Non-diastrophic deformation; mechanics of rock deformation, faults, folds, joints, cleavage, structures associated with igneous rocks, structures in sedimentary and metamorphic rocks, petrofabrics, alpine tectonics, structural studies of selected Australian and overseas localities.
Practical
Advanced structural mapping, solution of structural problems by various methods, introduction to petrofabric analysis.

7.602 GEOLOGY
(This subject includes the subject-matter of 7.502 Geology and 7.511 Introductory Geology and Mineralogy.)

Introduction to geology, cosmology and structure of the earth: agents of denudation, weathering, river action, glaciology, wind action, the sea and its action, lakes, subsurface water, diastrophism, vulcanism and earthquakes; igneous, sedimentary and metamorphic rocks, coal and petroleum.


Laboratory
Examination and identification of common minerals and rocks in hand specimen. Interpretation and preparation of geological maps and sections.

Examination of crystals and crystal models. Macroscopic examination of some common mineral groups.

7.612 AND 7.612A MINERALOGY
A course in mineralogy for students in Metallurgy.

The crystalline state of minerals; fundamental laws of crystallography, symmetry elements and symmetry operations; crystal systems and classes; Miller indices; stereographic projection of crystals. Examples of the more common crystal classes. Regular and irregular attachment of crystals, twinning, etc.; crystal growth and its anomalies.

Fundamentals of the atomic structure of crystals; Bravais lattices; examples of the atomic structure of some common minerals.

Physical properties of crystals; cleavage, gliding, secondary twinning, elasticity. Elements of crystal optics in polarised light.

Mode of formation of minerals and ores in the igneous, sedimentary and metamorphic cycles; introduction to petrology. Principal types of economic mineral deposits. Elements of fuel geology; construction and refractory materials.

Classification of minerals. Descriptive mineralogy of common minerals, especially economic minerals.
Laboratory

Crystallography—Examination of crystals and crystal models for symmetry; perspective drawing of crystal models.

Optical Mineralogy—Examination of minerals by means of the polarising microscope in transmitted and incident, reflected light. Determination of the refractive indices of crystal fragments by means of the immersion method.

Descriptive and Determinative Mineralogy—Macroscopic examination of common minerals, especially economic minerals; study of the paragenesis and mode of occurrence of common mineral groups. Study of principal rock types in which they occur.

7.633 Geology

Occurrence and structures of the igneous rocks; consolidation of magmas; classification of igneous rocks. Thermal, regional and plutonic metamorphism. Composition and classification of sedimentary rocks; sedimentary environments.


Geological evolution of the Australian Continent from Pre-Cambrian to Recent.

Laboratory

Microscopic examination of minerals and rocks.

Study of a wide range of ore minerals; vein structures. Wall rock alteration. Examination of suites of ores.

Examination of petroliferous sediments. Micropetrology of coal. An introduction to palaeontology.

7.644 Geophysics and Geotectonics

This subject follows on from 7.543 Geophysics.

A more detailed treatment of the various geophysical methods of exploration with special reference to mining and engineering. An outline of geotectonic concepts, orogenesis, isostasy, geo-magnetism, age determinations; subsidence and rock bursts in mining.
7.673 Engineering Geology
A course for Civil Engineering Students

The application of geological investigations to civil engineering work. Rock types and their structural features in relation to engineering practice—quarries and excavations, tunnels, dams, etc. Study of ground water—water supply, porosity and permeability problems in civil engineering.

Geology of dam sites and reservoirs, roads and road materials. Coastal and river erosion. Geophysical methods applicable to civil engineering. Elasto-plastic properties of rocks.

Field Work
One week excursion to visit major civil engineering projects.

7.703 Geology
A course in geology for Architecture students.

Introduction to geology. Agents of denudation, weathering, river action, glaciology, wind action, marine erosion, sub-surface water, diastrophism, vulcanism. Igneous, sedimentary, and metamorphic rocks.

Geological aspects of foundations, building stones, materials of construction.

Laboratory
Examination and identification of common minerals and rocks in hand specimens. Interpretation and preparation of geological maps and sections.

Field Work
Six excursions to be held on Saturdays during the year.

7.912 Fuels I


(b) Fuel Laboratory I—Sampling and analysis of fuels and calorimetry.

7.913 Fuels II


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(b) **Refractories and Insulating Materials**—Raw materials and manufacture; properties of importance. Selection and testing. Uses. Lagging and lagging materials. The economics of insulation.

(c) **Fuel Laboratory II**—Gas analysis. Analysis of liquid and solid fuels; mineral matter and minor constituents. Testing of fuels and refractories to specifications. Calorimetry.

7.914 **Fuels III**


(b) **Fuel Science**—Coal chemistry and coal constitution; ultrafine structure; pyrolysis and thermal decomposition; rheological properties; low temperature oxidation; reactivity; solvent extraction. Scientific advances and their application to coal carbonisation, gasification, synthesis and the production of basic chemicals from coal and its products. Flames and flame propagation.

(c) **Fuel Seminar**—Discussion of fuel problems and alternative sources of power. “Industrial experience” report of vacation work and works visits; research papers and developments in the scientific uses of coal, coke, gas, oil, and nuclear energy.

(d) **Fuel Laboratory III**—Chemical and physical analysis and evaluation of oil, gas, tar, coke and coal. Carbonisation assays. Plasticity.

7.924 **Fuel Plant Technology I**

(a) **Fuel Plant**—Design, construction, testing and operation of boilers, furnaces, ovens and kilns; blast furnaces and cupolas. Auxiliary plant. Selection of fuels; economic considerations. Steam utilisation, heat distribution, sources of heat losses; waste heat recovery, recuperation and regeneration. Atomic energy as a fuel.

(b) **Instrumentation and Automatic Control**—Scientific control; instruments and techniques; gauges, meters, pyrometers, servomechanisms. Atmospheric pollution and control of noxious emissions.

(c) **Fuel Laboratory IV**—Pyrometry. Boiler feed water control and analysis. Boiler plant efficiency tests. Model techniques for studying flow patterns in furnaces. Pilot scale testing; combustion, gasification and coke-making. Works visits.

7.934 **Fuel Project**

An investigation of and a report on some problem in fuel technology.

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Science Course Subjects

Geology I (Science)

This subject covers the following topics (divided into Part I and Part II for the part-time course):

Part I

7.602 Geology. (This subject includes the subject-matter of 7.502 Geology and 7.511 Introductory Geology and Mineralogy.)

Part II

7.512 Mineralogy and Crystallography.

Geology II (Science)

This course of approximately 360 lectures and practical periods consists of a treatment of the following subjects:

Part I

7.503A Petrology, 7.523A Stratigraphy and Palaeontology, and 7.533A Economic Geology.

Part II


Geology III (Science)

The subjects which constitute this course of approximately 300 lectures and practical periods are as follows (divided into Part I and Part II in the part-time course):


Laboratory—Examination and description of a wide range of fossil animals and plants (including vertebrates). Laboratory techniques in palaeontology. Comparative studies of species and sub-species, study of morphological variations through time.

Together with—

7.504 Advanced Petrology.
7.513 Advanced Mineralogy.
7.543 Geophysics.
7.564 Photogrammetry and Photogeology.

Students are required to submit a thesis on an approved topic.
CIVIL ENGINEERING
Subjects 8.00 to 8.94

8.11 AND 8.11D ENGINEERING MECHANICS

Graphs—(a) Uses, types, construction and drawing, choice of scale, applications, representations. (b) Straight line and curves. (c) Line diagrams—their application to the problem of linearisation; logarithmic graphs. (d) Graphical differentiation and integration.

Statics—(a) Laws of equilibrium, (b) Graphic statics, i.e., funicular, force and link polygons, Bows' notation. (c) Analytic statics.

Bending Moment, Shear Force and Axial Force—(a) Definition, sign convention. (b) Analytical calculation and its application to straight, bent or curved bars. (c) Algebraic expression in terms of position of section along bar. (d) Relationship between bending moment, shear force and loading on beams.

Pin-jointed Frames—(a) Definition of and recognition of static determinancy. (b) Graphical analysis by separate force polygons at each joint, force diagrams. (c) Analytical investigation of forces by resolution at the joints, method of sections, etc. (d) Treatment of intermediate loads (loads not applied at pin joints).

8.112 and 8.112d THEORY OF STRUCTURES

Stress, Strain, and Moduli of Elasticity—Stresses in non-uniform bars, compound bars, temperature stresses, riveted and welded joints, thin boiler shells, centrifugal tension. The foregoing to be treated as examples illustrating the meaning of the terms "stress" and "strain" and the method of applying them in engineering.

Oblique Stress—Stress conditions at a point. General description of stress state, definition of principal stress, principal planes, etc. Mohr's circle of stress. Given the stress condition on two mutually perpendicular planes to find the principal stresses and axes by Mohr's circle and analytically. Strain at a given point. Poisson's Ratio. Relationship between moduli of elasticity and Poisson's Ratio.

Axial Force, Shear Force, Bending Moment and Torque—Definition. Expression as a function of position. Graphical representation. Relationship between load, shear force and bending moment, for straight beams with loading normal to axis.


Stresses due to Axial Force
Stresses due to Bending Moment

Stresses due to Shear Force—Horizontal shear, distribution of shear stresses across beams of various shapes.
Stresses due to Torsion in Circular Shafts—Limitations of theory with regard to other shapes.

Combined stresses due to any combinations of the above cases.

Slope and Deflection of Beams—Relationship between bending moment, slope and deflection. Limitations of simple theory of bending. Basic differential equations of simple beam theory. Area moment theorems. Use of foregoing in solution of beams fixed at one or both ends.

Strain Energy—Expressions for strain energy due to axial force, shear force, bending moment, torque.

Shock Loads—The effect of suddenly applied loads and loads dropped from a height.

Springs—Helical springs, flat leaf springs.

Limitations of Elastic Theory

8.113 and 8.113d Structures

(a) Lectures
Influence Lines—For statically determinate structures including three-hinged arch.

Three-moment Equations—Applied to beams with non-deflecting supports. Indication of how the equations may be extended to continuous beams on deflecting supports.

Introduction to Three-dimensional Statics—Composition and resolution of forces, direction cosines, moment of an oblique force about any axis, equations of equilibrium.


(b) Drawing Office
1. Problems on influence lines for statically determinate beams, trusses, three-hinged arched frames and three-hinged arch trusses.
2. Problems on three-moment equations.
(a) Lectures

Analysis of Rigid Frames—Moment distribution, stiffness and carry-over, methods of calculations. Calculation of shears in a rigid frame; allowance for sidesway.


Timber Design—Introduction; special characteristics of timber, directional properties; strength properties; mechanical properties. Joints in timber, brief mention of nailed and screwed joints; bolted joints; timber connectors; joints in a composite truss; spliced joints.

Beams and joists; main requirements in design; notched beams; built-up beams.

Columns and struts; discussion of various column formulae; straight line formula; fourth power parabolic formula; secant formula.

Details in design of timber bridges; composite bridges; timber beam bridges.

Pre-stressed Concrete—Introduction. Advantages and limitations, pre-tensioning and post-tensioning, including brief description of methods and apparatus. Design of simple beams and columns.

Space Frames—Analysis by tension coefficients.

Non-uniplanar Bending—Principal axes of section; method of determination; effect of non-uniplanar bending.

Torsion—Influence of shape of section on torsional stresses; the shear centre and its approximate determination. The torsion constant $K$, and methods of evaluation for non-circular sections.

Retaining Walls and Small Dams

(a) Theory of Earth Pressures—Rankine's theory, wedge theory (revision only).

(b) Retaining Walls—Stability; walls with vertical and inclined faces; methods of failure; drainage, details of design of gravity walls and cantilever walls; brief mention of other types. Pressure on retaining walls due to various loads on the backfill.

Limit Design—Introduction, review of design philosophies, factor of safety and load factor (as used in aircraft design), development of limit design formulae and methods for simple structures, both steel and reinforced concrete.
**Introduction to Model Analysis**—Similarity conditions, Begg's apparatus, calibration, direct measurement of strains, bending moment and curvature. Brief account only of photoelastic method with list of reference.

*(b) Drawing Office Work*

Complete design of a simple reinforced concrete frame, including calculation of B.M. and S.F. diagrams.

Design of a composite timber and steel truss either for a road bridge or for a roof.

Design of a gravity retaining wall and a cantilever retaining wall.

Design of a simple pre-stressed beam.

**Work in the Model Structures Laboratory.**

**S.122 and S.122d Structures**

*(a) Lectures*

Relation between design, analysis, proportioning, brief review of design principles—"dead" and "live" loads; equivalent uniform loads; factors of safety; load factors; excessive deflection, instability.

Other hazards—fire resistance, corrosion, decay. Codes of practice, diversity of fields covered, life of structure.

Factors affecting design—erection and transport, availability of materials, and plant.

Design procedure—specifications, drawings; layout, details, shop details, bills of quantities, calculations and records.

Design of riveted joints, types of joints, general requirements, analysis of eccentrically loaded rivet group. Design of tension splice.

Welded joints. Types of joint; general requirements of welding; brief description of welding techniques. Design details.

Columns. Theory of centrally loaded and eccentrically loaded columns; derivation of Euler's formula, revised Perry formula; brief mention of Rankine and straight line formulae. Design of plated I-section columns.

Design of beams, plated beams and plate web girders. Allowable stresses in compression flange; design details of web flanges, stiffeners, splices, etc.

Design of roof trusses. Approximations used in analysing knee-braced bents.

*(b) Drawing Office*

1. Design of plated R.S.J. column.
2. Design of built-up beam or girder.
3. Design of mill-building bent or roof trusses.
8.123 AND 8.123D STRUCTURES
(For Students of Mechanical Engineering.)

(a) Lectures
Relation between design, analysis, proportioning; "live" loads; equivalent uniform loads; factors of safety; load factors, excessive deflection, instability.

Other hazards—fire resistance, corrosion, decay. Codes of practice, diversity of fields covered, life of structure.

Factors affecting design—erection and transport, availability of materials, and plant. Design procedure, specifications, drawings, layout, details, shop details, bills of quantities, calculations and records.

Riveted joints—types of joint, general requirements, eccentric connections, tension splices.

Welded joints—types of joint, general description of welding techniques, design methods.

Columns—theory of columns, Euler's theory, brief mention of Rankine and revised Perry theories.

Eccentrically loaded columns—design of simple columns and plated columns.


Influence lines for statically determinate structures. Continuous beams, theorem of three moments.

Beams and girders—methods of design of built-up girders, compression flange stresses, stiffeners, etc. Crane runway girders, impact.

Properties of concrete as a structural material.

Design of reinforced concrete beams—general assumptions, working stresses, singly reinforced beams, doubly reinforced beams, web reinforcement, shear stresses, bond stresses, continuous beams. Design of R.C. column footings.

(b) Drawing Office
(i) Influence line problems.
(ii) Problems on continuous beam theory.
(iii) Design of plated R.S.J. column.
(iv) Design of crane runway girder.
(v) Design of roof truss.
(vi) Design of simply-supported, doubly reinforced concrete beam.
(vii) Design of three-span R.C. beam.
Statics—Composition and resolution of forces. Equilibrium of co-planar concurrent forces. Couples, moments. General equilibrium of co-planar forces, funicular polygon.

Framed Structures—Stresses in simple pin-jointed frames by graphical methods, method of sections, and method of resolution at joints.


Resilience—Of bars in direct tension, suddenly applied loads, impact loads.

Oblique Stress—Normal and tangential components of stress. Shear stresses on planes at right angles. Definition and description only of principal stresses and principal planes.

Bending of Beams—Shear force, axial force, bending moment, relationship between load, shear force and bending moment, S.F. and B.M. diagrams (algebraic and graphical methods). Distribution of bending stresses in beams. Distribution of shear stresses in beams, application to built-up beams.

Deflection of Beams—Elastic line, slope, deflection, relationship of slope and deflection to B.M. and to load. Algebraic solution of statically determinate beams and simple indeterminate beams such as propped cantilevers, uniform fixed-ended beams. Area-moment methods.

Torsion—Relationship between torque, H.P. and R.P.M. angle of twist. Stresses due to torsion in solid and hollow circular shafts. Limitations with respect to beams of non-circular section.

Springs—Helical springs, deflection, stresses, resilience. Flat leaf springs, deflection, stresses and resilience.

Combined Stresses—Effect of combined bending and twisting, bending and axial force, etc.

Buckling of Columns—Slenderness ratio. Euler’s formula (without proof), straight line formula. Application of formulae to problems.
8.22 MATERIALS LABORATORY

A materials technology course for students in Architecture.

Section 1. General Materials Technology

This section consists of 15 hours of lecture work and 33 hours of laboratory work as follows:

Principles of engineering laboratory practice, introduction to the precision of measurements and the calculation of errors. The behaviour of constructional materials is considered, with special emphasis on standard tests and material characteristics in tension, compression, shear, impact, hardness, fatigue, and creep. Some non-destructive test methods will be given, with special mention of their application to building practice. Efficient utilisation of materials with reference to durability, appearance and economy.

Laboratory work will consist of tension behaviour of common metals, compression, behaviour of common timbers, shear, impact, and cleavage tests on these timbers, compression and bending tests on clay bricks, tiles, etc., demonstration of other experimental and testing techniques.

Section 2. Concrete Technology

This section consists of 12 hours of lectures and twenty-four hours of laboratory work serving as an introduction to Concrete Technology, as follows:

Principal types of cements, their properties and simple testing; cement handling and storage. Concrete aggregates, characteristics, grading, and testing. Admixtures. Factors affecting concrete properties. Basic concrete mix requirements and mix design methods. The manufacture of concrete and job control.

Laboratory work includes the testing of cement, aggregate, and concrete, and the examination of concrete mix design techniques, workability, yield, and air entrainment.

8.23 AND 8.23D MATERIALS OF CONSTRUCTION

Concrete—Materials used in modern concretes; manufacture, physical and chemical properties of cements; production, testing, and selection of aggregates; pozzolans; admixtures. Strength, durability, workability, elastic and other properties of concretes. The design and proportioning of mixes. Manufacture and field control, mixing, transporting, placing, curing, formwork, testing. Special types of mortars, concretes, and special techniques.

Aluminium—Brief summary of manufacture, properties and use of structural aluminium alloys.

Miscellaneous Materials—Structural clay products, special laminates and plastics.

Laboratory Work
Testing of portland cement for soundness, specific surface and strength; testing of fine and coarse aggregates for impurities, specific gravity, moisture, unit weight and grading. Examination of concrete workability and strength and the effect of admixtures. The effect of curing conditions, end conditions and age on the compressive strength of concrete specimens.

Preparation of concretes by different mix design methods. Special assignments, such as the design, manufacture and testing of reinforced concrete beams.

8.33 Engineering Computations
Construction of intercept charts for three or more variables.
Construction of nomographic charts by use of determinants.
Solution of algebraic and transcendental equations by simple iteration methods—horizontal iteration, Newton-Raphson method.

Brief introduction to matrices—multiplication inversion. Solution of linear simultaneous equations—(a) by Cholesky (Crout) method, and (b), by relaxation.

Introduction to finite differences. Theorems and proofs in difference calculus to be given only if essential for application. The difference equation. Solution of differential and partial differential equations by using differences. Application to instability problems.

Relaxation methods applied to solution of problems involving differential equations such as Poisson's equation, using the previous work.

8.41 Surveying
A course on surveying as applied to electrical engineering.

Instruments and Equipment
Chaining; types of bands and tapes; methods of measurements; corrections to be applied to measured lengths; chain surveys. Theodolite; various types; description of theodolite; method of reading angles, horizontal and vertical; precautions to be taken to eliminate instrumental errors. Minor instruments; prismatic compass; abney clinometer optical square; prism square; box sextant; methods of use of each.
**Field Procedure**

Bearings; true; magnetic; grid; assumed; calculation of bearings from angles. Traverses; closed and open; field notes; field methods; compass traverse; theodolite traverse; checking angular close; latitudes and departures; checking linear close. Detail surveys; control traverse; radiations; offsets.

**Levelling**

Definitions of terms. Methods of levelling; differential; barometric; trigonometrical. Instruments used in differential levelling; surveyor's level; tilting and non-tilting type; checking and adjusting level; use of level; staff Sopwith pattern. Field procedure; field practice; method of booking; reduction of staff readings; checking reduction; precautions to be taken when levelling. Tacheometry; stadia system; formulae for horizontal and inclined sights; instrumental constants; determination of constants; method of field procedure; booking; reductions; horizontal and vertical components; tacheometer traverse; accuracy; direct reading tacheometers. Contours; definitions; setting out a contour; contour survey; various methods of field procedure; plotting. Transmission line surveys; information required; location survey; field procedure; plotting longitudinal section; fixing position of poles; templates; marking out pole positions; easements. Setting out; methods of setting out buildings, machinery, etc.

**Practical Work**

One week at Survey Camp.

Chaining; plumbing; step chaining; slope chaining. Theodolite; reading horizontal and vertical angles; azimuth traverse. Traverse; detail survey; control traverse; radiations and offsets to locate features; plotting. Levelling; checking level; closed level circuit; levelling for plotting profile. Tacheometry; checking constants; reading staff; closed tacheometer traverse; reductions. Transmission line survey; tacheometer traverse for a proposed transmission line; plotting longitudinal section; fixing pole positions.

8.42 and 8.42A Land Surveying

The principles of the theodolite and dummy-level; use of level in taking longitudinal and cross-sectional profiles and in setting out works for construction; simple applications of the use of the theodolite in building construction work; simple traverses; setting out; contouring on a grid; simple earth-work problems.

8.43 and 8.43D Surveying

Spherical trigonometry. History and development of surveying; various types of surveys; instruments and equipment used; chaining;
types of bands and tapes; corrections; accuracy. The theodolite: principle and construction; use of theodolite; adjustments of theodolite; mathematical theory; bearings; traverses; angular and linear misclose; latitudes and departures, allowable errors; various methods of adjusting traverse miscloses, areas by double longitudes; levelling; theory of the engineer's level; types of levels; adjustments of the level; differential levelling; field practice; reduction of levels; definitions; purpose of levelling; grading; vertical parabolic curves; calculation of volumes of earthwork and other material; curvature correction; prismatic and mean end area formulae; horizontal circular curves; simple and compound; tacheometry; description of instruments used in tacheometry; stadia; theory and formulae; contours; methods of field procedure; volumes from contours; description, adjustment and use of minor instruments; nature, causes and classes of errors of measurement, linear and angular.

8.44 AND 8.44D SURVEYING

Stadia surveying and application to engineering surveys; field methods of topographical surveying and computations; plane tabling; small scale and large scale; instruments used; barometric levelling; theory-corrections; field procedure; reduction of barometric readings; triangulation and its application to engineering projects, civil and mining; station and figure adjustments; requirements and field work of investigation surveys for roads, railways, water supply, sewerage, irrigation, transmission lines; theory of transition curves; cubic parabola spiral, lemniscate; setting out transition curves; elementary theory of tides; hydrographic surveying in rivers and estuaries; stream and tide gauging; soundings; precise levelling; trigonometrical levelling, reciprocal and non-reciprocal.

Underground and mining surveys; transferring azimuth and levels below ground; special equipment and methods used; solution of problems in mine surveying; bore hole problems; intersection of drive or tunnel and strata; tunnel surveys; alignment and setting out; survey of bore holes. Elements of aerial photogrammetry and its application to engineering investigations; photo interpretation.

Astronomy; description of terms used; simple methods of determining azimuth, latitude and time. Introduction to theory of map projections; special mention of Transverse Mercator Projection.

Brief outline of land laws; systems of title; searching; easements: types of tenures; types of survey marks; power of entry; Survey Co-ordination Act and Regulations; sections of Coal Mines Regulation Act and Mining Act relating to surveys and plans.
8.53 AND 8.53D FLUID MECHANICS


8.54 APPLIED HYDRAULICS

Non-uniform flow in open channels, channel transitions, hydraulic jump, waves, surges. Discharge measurements.

Potential flow, application to hydraulic structures. Weirs, spillways, energy dissipation.

Pipe flow, networks; unsteady flow, surge, water hammer. Sedimentation.

8.63 CIVIL ENGINEERING

This subject is divided into sections designed to cover the following specialised fields:

8.63A Engineering Construction


8.63B Hydrology

A basis course in engineering hydrology with emphasis upon principles, and with an introduction to flood and yield estimation. Topics covered comprise elements of meteorology and climatology, analysis of precipitation for engineering purposes, stream gauging, the run-off process, infiltration, flood estimation, yield studies.

8.64 CIVIL ENGINEERING

This subject is divided into sections designed to cover the following specialised fields:

8.64A Public Health Engineering


8.64b Road Engineering


8.65 Civil Engineering

8.65A Railway Engineering


8.65b Harbours and Rivers Engineering


8.65c Irrigation Engineering

Natural and artificial irrigation. Soil deterioration and prevention. Water requirements. Sources of water. Methods of application to land. Investigation and design of irrigation system.

Special structures and appurtenances. Water metering. Operation and maintenance of system.

8.65d Hydro-electric Engineering

Electricity supply systems, hydro-electric plant, hydro-electric power schemes, combined thermal and hydro systems, economic factors, hydro-electric potential—determination of storage requirements and plant capacity.

8.66 Civil Engineering

8.66A Engineering Construction

Advanced earthworks methods, tunnel mechanisation, major bridge foundations, reinforced concrete and prestressed concrete construction, steel fabrication and erection, river and coastal control works, works organisation, major project planning. Soil exploration, stability problems in soils, soil stabilisation, moisture movement in subgrades.
8.66B Engineering Administration

General conditions of contract, principles to be observed in drawing up contract documents including specifications, with practical assignments. Quantity surveying applied to civil engineering works, preparation of estimates, drafting of specifications. Costing systems, cost statements, financial comparison of projects, sinking funds, capitalised cost, depreciation, management, personnel control and industrial relations.

8.73 and 8.73d Soil Mechanics

Physical and mechanical properties affecting soil action in engineering problems; coefficient of permeability, capillarity and compressibility and their application in practical problems relative to seepage, uplift and the settlement of buildings located above buried compressible soil strata; shearing strength, bearing capacity and earth pressure, and their application to engineering problems, including retaining walls.

8.73h Soil Mechanics and Hydrology

Soil Mechanics—Physical and mechanical properties affecting soil action in engineering problems; coefficient of permeability, capillarity and compressibility and their application in practical problems relative to seepage, uplift, liquefaction and the settlement of buildings located above buried compressible soil strata.


8.912 Properties of Materials

A course for students in Metallurgy.

This course has been designed as a complete course in materials technology and the mechanics of materials. The lecture work is as follows:

(a) Principles of material laboratory practice, types of testing machines used and their characteristics. Precision of measurements, and introduction to the theory of errors, calculation of maximum and standard errors. The stress-strain behaviour of metals and alloys is considered with special reference to the results of standard tests in tension, compression, hardness, micro-hardness, impact, shear, torsion, creep and fatigue. Non-destructive test techniques. Theories of failure, inelasticity, plasticity lost.

Laboratory

Includes tension, compression, hardness, impact, torsion and bending tests; also investigations in over-straining and inelastic behaviour, creep and fatigue.

8.92 AND 8.92D PROPERTIES OF MATERIALS

The lecture work deals with the principles of engineering laboratory practice, types of testing machine used, precision of measurement, introduction to the theory of errors, and calculation of maximum errors. The load-deformation behaviour of engineering materials is considered, particularly with regard to the results of tension, compression, shear, impact, hardness, fatigue, and creep tests.

Laboratory work includes tension, compression, hardness, and impact tests with metals, and experiments on flexure and torsion.

8.92M PROPERTIES OF MATERIALS

A course for part-time students in Electrical Engineering.

An introductory course in the mechanics of materials. Lecture work includes types of tests and investigations, treatment of errors, and the behaviour of engineering materials when subjected to tension, compression, hardness impact, bending, fatigue, and creep tests. Mention will also be made of some non-destructive testing techniques.

The laboratory work will include four selected experiments from the following: Tension, compression, impact, hardness, flexure, torsion, overstraining, calibration of wires and springs.

8.94 PROPERTIES OF MATERIALS

Detailed treatment of material properties and uses; elastic and inelastic behaviour; methods of failure and various theories related therewith; design factors; non-destructive test procedures; experimental stress-analysis methods.

Laboratory work includes tests on timbers and wires, creep experiments and work with wire resistance strain gauges.

PROFESSIONAL ELECTIVES

Two elective subjects are to be selected.

Theory and Design of Structures

Study of design aspects of civil engineering by further work on influence lines for statically indeterminate structure, relaxation theories and the mathematical theory of elasticity together with topics such as arches, columns, prestressed concrete, column analogy, limit design of steel structures and model analysis.
Soil Mechanics

Advanced studies of theoretical and applied sections of soil mechanics, including foundations, mass soil behaviour, tunnels and arching, stability of slopes, earth dams, soil testing and stabilisation work.

Hydrology

Hydrometeorology, design storm synthesis, infiltration, unitgraphs, flood-routing, synthetic unitgraphs, flood frequency studies, urban drainage design, evaporation and transpiration, rainfall-runoff relations, yield investigations, groundwater.

Hydraulics

Further work in hydrodynamics; the theory and practical applications of hydraulic models; sediment transportation; miscellaneous advanced topics as time permits.

Construction Equipment and Methods


Geology

Role of geology in civil engineering—functions of the geologist and the engineer.

An introduction to micro-petrology of the rock materials utilised by civil engineers—clay minerals and their properties. Minerals deleterious to cement.

Advanced studies in lithology and rock types and their structural features in relation to engineering practice. Depth of weathering. Materials of construction and their distribution in New South Wales. Further treatment of elastoplastic properties of rocks. Further study of groundwater, its importance as a water supply, groundwater problems in tunnelling, dams, etc.

Geophysical techniques utilised by civil engineers. Drilling methods utilised by civil engineers for exploratory work—examination of cores, grouting, and water leakage, etc.

Practical work to include further studies of rock types, structural features of rocks, and the decomposition of rocks. Identification of mineral substances affected by weathering or deleterious to concrete, etc.

Micropetrological examination of rock material. The use of geophysical apparatus. Advanced mapping problems and introduction to the use of aerial photographs in geological mapping.

Field work to include visits to major dam sites and engineering projects where active geological exploration and modern drilling techniques are utilised.
Management


Highway Engineering

This course will extend the work covered under 8.64b Road Engineering. The following topics will be dealt with:

Road planning, detailed geometric design, transition curves, types of arterial roads, design of road intersections, methods of controlling traffic, channelizing, preparation of road schemes, properties and testing of road materials, bitumen, tar, aggregates, concrete, stabilized forms of construction, design of flexible and rigid pavements, geological consideration in road design, use of roadmaking plant.

In addition the student will be given an assignment involving the preparation of a technical report or the preparation of a small road scheme.

Surveying

A specialised study of all aspects of topographical surveying and its application to major civil engineering projects.

Study of terrestrial and aerial photographic surveying and the theory of photogrammetry. Use and principles of stereoscopic mapping instruments.

Specifications for aerial photography.

Application of aerial photography to civil engineering projects and geology.

Concrete Technology

Further studies in basis behaviour of concrete materials. Introductory cement chemistry and micromeritics, testing and characteristics of additive and replacement compounds. Aggregate gradings, workability, mix design methods.

The physical behaviour of set concretes, including elastic properties, creep and introductory rheology, durability, permeability, failure theories, etc. Concrete control and special techniques.

Experimental Stress Analysis

The theory and practice of two dimensional photoelasticity, including appropriate investigations with simple models. Structural similitude, analogies. The wire resistance strain gauge. Static and dynamic strain gauge circuits. Selected experimental investigations to illustrate the subject matter.
Surveying Degree Course Subjects

8.401 Plotting and Plan Drawing

Use and care of equipment; conventional signs; line work and lettering; size and type of different plans; plotting from field notes; tinting and colouring. Levels; plotting longitudinal and cross sections; grading; mechanical methods of enlargement and reduction of plans; plotting notes of a tacheometer survey; contouring; technical description of boundaries; plotting from descriptions; preparation of plans for lodging at Land Titles Office and Lands Department; use of planimeter; map reading; searching; obtaining survey information.

8.404 Map Compilation and Reproduction

Purpose and scope. Theory of photolithographic process; map characteristics; production planning; drafting; assessment of basic data for compilation; copy correction; colour separation; process photography; negative corrections and layouts; plate graining; plate processing; cameras; offset printing.

8.411 and 8.411d Surveying

History of surveying: Elements of surveying; chaining; tapes and bands; corrections to measured lengths, errors in chaining; chain surveys; field procedure. Angle reading instruments, compass, sextant, theodolite; construction, adjustment and principle of each. Theodolite surveys; method of reading horizontal and vertical angles; traversing; azimuth and bearing; checking angular and linear close; latitudes and departures; adjusting misclose; area by double longitude or double latitude; field notes; mathematical theory of the theodolite adjustments; elementary theory of errors and determination of the precision of measurements. Levelling; types of levels and staves; adjustment of level; definitions; field procedure; reduction of levels; cross levels; grading; earthworks and quantities, mean area and prismoidal formulae; setting out; horizontal circular curves; compound curves; vertical curves. Duties of chainman; survey marks. Minor instruments.

8.412 and 8.412d Surveying

Contours; tacheometry; plane tabling; barometric levelling. More advanced earthwork problems, including curvature correction. Road and railway location. Theory and setting out of transition curves; cubic parabola, spiral, lemniscate. Setting out multi-storied buildings and engineering structures. Modern instruments; construction and adjustment of modern survey instruments.
8.413 AND 8.413D SURVEYING

Topographical surveying; underground and mining surveys; instruments used. Transferring azimuth and levels from surface to underground; bore hole problems; deep bore hole surveys. Alignment and setting out of tunnels; intersection of tunnel line and rock strata. Theory of tides; hydrographic surveys. Transmission line surveys. Requirements and fieldwork for surveys for water supply, sewerage, drainage and irrigation. Torrens Title and Old System Title surveys; identification surveys.

8.422 SURVEY COMPUTATIONS

Problems in chainage correction, errors, closes missing lines, areas, cutting-off areas, curves, roads and road intersections; offset areas, and other problems met with in land surveying.

8.423 SURVEY COMPUTATIONS

More advanced problems dealing with areas, curves, etc., and also problems met with in mine surveying.

8.432 LAND UTILIZATION

Climate; climate and vegetation; types and properties of soil and their relation to physiographical facts and effect on land use; soil erosion; administrative approach to soil conservation; methods of combating erosion; farm products in relation to soil; grass lands; economics of land subdivision (rural); forestry in relation to land use; principles of afforestation; timbered lands in New South Wales; distribution of the principal timber species in New South Wales; identification of native trees; uses of timber.

8.442 ASTRONOMY

Spherical trigonometry; celestial sphere; celestial co-ordinates. Time; use of ephemerides. Corrections to solar and stellar observations; errors due to maladjustment of instrument. Star maps. Prismatic astrolabe; chronometers. Determination of azimuth, time, latitude and longitude; determining best position of star for observations for azimuth, time and latitude.

8.443 ASTRONOMY

More advanced study of subject matter of 8.442 Astronomy. Field observations and reductions of precise measures of latitude, longitude and azimuth. Theoretical basis of methods and derivation of formulae. Instruments used on precise observations. Reduction of star places from mean to apparent. Table of Fundamental Stars (F.K. 3).

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8.452 Geodesy

Historical outline. Figure of the earth. Reconnaissance and signal building. Strength of figures; base lines; setting out and measuring; observing routine on first and second order triangulations; instruments used. Satellite stations; intervisibility of stations; computations connected with first and second order triangulations; station and figure adjustment; “point to point” calculations; Clarke’s, Puissant’s and Mid Latitude formulae; third and fourth order triangulation; intersections; resections; standard traverses; field procedure calculations and adjustment; trigonometrical levelling; refraction and curvature; reduction of observations; Biot’s hypothesis; precise levelling; setting out parallels of latitude; meridians and oblique arcs.

8.543 Geodesy

Theoretical basis of methods of computation on the spheroid and on plane surveyor’s projections of primary triangulation, precise traverses and geodetic levels; reduction of observations to sea level; long lines on the spheroid and on plane surveyor’s projections with particular reference to radar distances. Trilateration; theory and principle of trilateration by means of radar; distance by high frequency light signals; theory of orthometric and dynamic corrections as applied to geodetic levelling; general knowledge of determining the shape and size of the earth; method of determining a suitable spheroid for a particular area; transfer of geodetic data from one spheroid to another; Laplace stations; computations; adjustment of net with angle, side, length, azimuth and position equations; adjustment of level nets.

8.454 Map Projections

Outline of map projections; different types of projections; advantages and disadvantages of each; choice of projection. Mathematical theory of the main projections, particularly Mercator, Polyconic, Cassini Soldner, Lambert Conical Orthomorphic, and Transverse Mercator. Computing co-ordinates; plotting projection; scale error; scale factor; grid convergence; grid co-ordinates; converting geographical co-ordinates to grid co-ordinates and vice versa.

8.473 Photogrammetry

Types of cameras. Geometry of the aerial photograph; definition of terms; perspective principles applied to photogrammetry; flying specifications; height and tilt distortion. Principles of stereoscopy; parallax bar; parallax measurement; control, ground and minor; graphic triangulation; Arundel method; slotted template; anharmonic rectifiers.
8.474 Photogrammetry

Construction of aerial cameras; calibration of cameras; camera lenses; operation of aerial cameras. Analytical and graphical investigation of tilt; the Scheimflug condition; principles of rectification of tilted photographs; oblique photography; different methods of plotting oblique photographs. Theory and use of stereo-plotting machines; appreciation of the advantages and disadvantages of the different types of machines. Methods of aero-triangulation; errors in aero-triangulation and their elimination. Interpretation of geological, topographical and artificial features. Terrestrial photogrammetry; field procedure; plotting terrestrial photographs. Use of terrestrial photogrammetry in large-scale geological mapping.

8.484 Land Valuation

General principles. Rural valuations; carrying and yielding capacity; cost of development; unimproved capital value and improved capital value; valuation of leasehold and freehold land. Urban valuations; subdivisional value of land; Acts and Regulations affecting land values; depreciation and obsolescence; court procedure and court decisions.

8.494 Survey Laws and Regulations

Outline and history of law. Systems of tenure; law relating to boundaries and easements. Common Law, Statute Law, Equity, Case Law; Acts and Regulations relating to land; searching and obtaining survey information; court decisions.

Civil Engineering Graduate Course Subjects

(Master of Technology)

8.115 Structural Analysis

Elastic Frame Analysis

Model Analysis

General introduction, historical, Hooke's law, Maxwell's theorem, Muller-Breslau principle, conditions of model similarity, model materials and their properties. Applications in practice, wire and spline models, Beggs and Eney deformeters, Eney charactometer, creep compensating balance, M.I.T. moment indicator and moment deformeter, brass spring truss models.

Plastic Theory of Analysis

Analysis and design of continuous beams, analysis of single portals with hinged or fixed supports by graphical method, virtual work method. Continuous frames, multi-storey frames, virtual work method, moment distribution method.

8.116 Structural Computations

Solution of equations by various methods. Solution of linear simultaneous equations by various methods. Introduction to matrix algebra and engineering applications. Relaxation methods. Finite difference calculus application—numerical solution of differential equations involved in the solution of torsion plate problems, etc. Use of electrical analogies in the solution of plate and related problems. Use of high speed digital computers in structural problems.

8.118 Concrete Shells

Types of shells, general description of shells and their uses.

The circular cylinder, determinate and indeterminate types, the beam theory, membrane solution, solution by iteration, analytical solution, derivation of basic equation, various forms of approximation, limits of applicability, particular integral, complementary functions. Single barrel and multi-barrel shells, northlight shells, the effect of edge beams, prestressed edge-beams, traverses. Cylindrical shells of non-circular section.

Domes, circular domes, membrane stresses, effect of edge disturbances, surface of revolution, finite difference approximations, shells of constant radius, doubly-curved shells generally.

8.119 Prestressed Concrete

Introduction and historical development. The principle of prestressing, methods of prestressing, properties of the materials used, cause of loss of prestress. The design of simple beams, stress criteria, design of cross section, cable profile, shear stresses, anchorages.

Design of high strength concrete mixes.

Statically indeterminate structures, calculation of the pressure line, the concordant cable, methods of computing redundant stresses, theorems relating to cable profiles. Application of theory to continuous beams and portal frames. Methods of securing continuity in practice, use of precasting.

8.120 Reinforced Concrete


The ultimate strength of R.C. sections in flexure, shear and tension, compression and combined effects. The application of these to ultimate load design of R.C. structures. Modes of collapse. Plastic hinges and their function in reinforced concrete. The ultimate strength design of slabs.


8.121 Theory of Elasticity


8.215 *Concrete Technology*

Brief review of the constituents of concrete and their salient properties. The use and purpose of admixtures. The strength of concrete and its relation to various factors, principally water/cement ratio, age, mix, etc. Aspects of strength, such as compressive strength, flexure strength, etc., and their correlation. Durability of concrete to different conditions of use and exposure. The resistance to attack by minerals.

Elastic properties. Variations of the elastic constants with strength, time, rate of test. Shrinkage and creep phenomena and their effect upon concrete structures.


8.515 Hydrodynamics

Fundamentals of non-viscous fluid flow in one, two and three dimensions, energy concepts, velocity potential, stream function in two dimensional flow and in three dimensional axisymmetric flow; circulation, vortices, super-position of flow patterns; complex variable, conformal transformations, inverse transformations, flow within boundaries and about immersed bodies; free streamlines, flow nets, graphical and relaxation methods; vortex motion, viscous flow, boundary layer theory.

8.516 Advanced Hydraulics


8.517 Hydraulic Design

Hydraulic design of earth and masonry dams and appurtenant structures, spillways, outlet works, multiple purpose projects; flood control, runoff, retarding basins, drainage transportation and deposition of sediment, fundamental studies, sediment sampling and analysis, river improvement, practical design procedures, hydraulic models, fixed and moveable bed models, tidal models, flow measurement techniques including electrical methods.
8.519 Principles of Hydrology

Elements of climatology and meteorology, theory and practice of streamgauging, analysis of precipitation, catchment characteristics and their significance, soil physics, the runoff process, interception, depression storage, infiltration, snow surveys and snow melt, evapotranspiration and consumptive use, data collection for all phases of hydrology.

8.520 Hydrologic Design


8.521 Hydraulic Laboratory Practice

Instruction and practice in laboratory techniques, design of experiments and carrying out of project investigations.
9.104 Nutrition


While particular emphasis will be given to nutritional requirements of sheep, those of other farm livestock will be dealt with in this section.

9.12 Livestock Production I

The livestock industry of Australia and its place in the economic life of the Commonwealth.

Production of livestock products and trends.

The livestock areas of Australia, the inter-relationships of the various classes of stock and the natural economic and artificial conditions determining the stratification of types.

Introduction to the breeds of livestock of importance to the pastoral industry and aids to judging.

The anatomy and physiology of the domestic animals. Breeds of sheep, their uses and economic relationships. Sheep management and calendar of operations. Classing of ewes and rams; culling. The purchase, care and management of the breeding ewes; crutching and wigging. Lambing; docking, marking and castration. Shearing. Weaning, drenching and the management of weaners. Dipping, mulesing, etc. Flock composition; principal sources of loss and their control.

9.124 Farm Management and Mechanisation

Business and practice of farming on various types of holding. Conditions governing class of farming in a district. Bookkeeping and valuation. Purchase and running of properties. Budgets. Economics of farm management. Inspection visits and comparative compilation of detailed reports of properties inspected or visited during practical work. Farm buildings, dips and yards. Tractors, farm machinery and implements, use and influence in farming orga-

9.13 Livestock Production II


9.134 Introductory Accounting

This course is intended for students whose major interest is in fields other than accounting. Its purpose is to give students an appreciation of the scope and functions of accounting and of the uses which can be made of accounting data, particularly as a means of control.

A general survey of accounting principles and their application in modern business; the functions and purpose of accounting; use of accounting data for information and control; the basic accounting doctrines and conventions; the theory of double-entry and the mechanics of bookkeeping; the books of account; control accounts; the determination and measurement of profit; matching costs and revenues; presentation of financial and operating statements; the trading and profit and loss accounts; the balance sheet; valuation of assets; depreciation; plant register; provisions and reserves; the funds statement; analysis of simple financial and operating statements; accounting reports for partnerships and companies.

Special applications of accounting principles to the particular industry.
9.14 LIVESTOCK PRODUCTION III

Principles of livestock production and their application in animal industry; reproduction and fertility; growth and development; milk secretion; nutrition and breeding.

Crossbreeding—sheep, cattle and pigs.

Factors affecting livestock production—pasture improvement, fodder conservation, water conservation, irrigation, supplementary and drought feeding, etc.

9.144 COMMERCIAL LAW

The elements of jurisprudence; the sources of law; principles of constitutional law; the administration of the law.

The law of contract, law relating to sale of goods and principal and agent; bailment; common carriers; insurance; partnership; bills of exchange; arbitration and awards; personal property; liens; bills of sale; mortgages; guarantees.

9.154 SYNTHETIC FIBRES

Study of the origin, identification and use of synthetic fibres used on wool processing machinery.

9.22 AGRONOMY

Economic and environmental factors affecting agricultural development and utilisation of land.


Soil—Soil formation and soil characteristics. Work of the soil surveyor. Requirements of a fertile soil. Physical properties in relation to crop production and land management. The supply of nutrients to plants; organic matter and the biological condition of soil; the nitrogen economy of soils.

Topography—Effect on climate, soil, erosion rate and utilisation of machinery.

Vegetative cover—Types. Clearing and developmental costs.

Proximity to markets—Transport of livestock, wool, wheat and perishable products.

Modification of environment—Irrigation and drainage; electricity supply. Scientific discoveries and developments.

Agro-climatological associations in the chief divisions of New South Wales.

Principles of crop production—Tillage, rotation of crops, fertilisers and manuring. pH of soil and its modification.

Sheep and irrigation agriculture—Economic combination; prospects for expansion. The place of sheep in wheat belt.

Trees on the farm—Suitable types for windbreaks and shade; fodder trees; establishment and after-care; direct practical values and incidental advantages.

9.24 Pastoral Agronomy

Climatic, vegetal, and topographic characteristics of the major agricultural and pastoral divisions of New South Wales, with special reference to suitability for stock raising and mixed farming.


Weeds in relation to the pastoral industry; harmful effects, factors in the control of weeds, methods of combating weeds, weedicides.

Principles of crop rotation. Rotations suitable for tablelands and Western areas.

Detailed treatment of crop plants utilised in sheep raising. Fodder conservation; principles; economics of conservation; cereal and meadow hay, silage, grain.

9.33 Economics


Economics of the wool industry:

(a) Production—the key importance of the wool industry in the Australian economy; climatic and other physical controls over the wool industry; trends in breeding—crossbreds and fat lambs; the long-term trend of production; the importance of research; the problem of drought; water and fodder conservation; the nature of costs.

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(b) Demand—the nature and direction of demand; the dependence of the wool market on external trade—possibilities of developing the domestic market and the export market.

(c) Substitutes—the history and present organisation of wool marketing; BAWRA and J.O.; the attitude of the wool industry to stabilisation programmes.

9.34 Banking, Currency and Foreign Exchange

Financial Institutions

Money: definitions, functions, and kinds of money.

Trading Banks: functions and objectives. The assets and liabilities of a trading bank.

Creation of credit by trading banks; factors determining demand for bank loans. Mechanism of credit creation and factors limiting credit creation by a bank. Bank deposits and voluntary savings. The theory of forced savings.


Domestic Monetary Theory and Policy

The value of money; meaning of the value of money and techniques for measuring changes in it. Index numbers: their nature, construction, uses and limitations.

Economic effects of changes in the value of money; variation in general price levels and price dispersion. Effects of marked instability of prices on the distribution of incomes and the nature of production.

Determinants of the value of money; the quantity theory, its nature, applications and limitations. The savings-investment theory; relationship between savings, investment and income; applications to explain changes in price levels. The effect of overseas lending and borrowing on internal price levels.

Monetary policy and economic fluctuation; the characteristics and causes of the trade cycle. Appropriate monetary and fiscal policy.

Exchange Rate Theory and Policy

Exchange rates and the balance of payments; meaning of exchange rates and methods of quoting. Forward exchange and arbitrage. A country’s balance of payments; meaning and composition.
Free exchange rates; effects of changes in the balance of payments on free exchange rates and the influence of changes in exchange rates on the items in the balance of payments. Favourable and unfavourable exchange rates and methods of adjusting them. The purchasing power parity theory; its nature, applications and limitations. Modern ideas of an equilibrium rate of exchange.


Exchange control; purpose and methods of exchange control, exchange adjustment and the International Monetary Fund.

World Monetary Conditions in the Twentieth Century

The characteristic features of world monetary conditions in the present century. The World War I period, post-war inflation, return to the gold standard, depression and recovery. World War II, and post-war periods.

The Australian Monetary System in the Twentieth Century

Characteristics of the Australian monetary system—(a) from Federation to World War I; (b) in the inter-war period; (c) in the World War II period; (d) since World War II.

9.44 Yarn Manufacture (Wool)

A functional and detailed study of the machinery used to produce worsted and woollen yarns. The various systems of spinning will be described and the latest developments aimed at economies in production. Consideration will also be given to the structures of the wool textile industry, its research activities and problems. Method of wool cleaning and drying. Worsted—functional aspects of worsted machinery. Details of worsted carding, preparing, combing and drawing on English, French, and Anglo-Continental systems. Spinning by flyer, cap and ring and later developments. Twisting and fancy yarn manufacture. Woollen—raw materials; the functional aspects and mechanisms of carbonising and blending; carding and ring and mule spinning; remanufactured fibres, their types and sources of supply; grinding, carding and spinning yarn calculation; yarn conditioning and testing; warping and winding; a résumé of problems in the processing of rayon on woollen and worsted machinery.
9.52 Wool


9.53 Wool

Preparation of wool, from various types of flocks, for marketing. Recognition of wool types and assessment of wool quality number. Wool pressing and branding. Sorting Merino and Crossbred wool to spinning quality and length. Classing various types of clips—large and small merino, large and small crossbred, large and small tablelands merino clips, comeback clips. Special treatment of clips from north-west, central west, Riverina and far-west districts. Wool appraisal in terms of type, quality, number and yield. Wool judging.

9.54 Wool (Wool Store Study)

This subject will consist of practical exercises in the estimation of wool types and their values, using existing trade procedure (A.W.R.C. types). Instruction will cover style grades; burr, seed and dust percentages; washing—carbo, and top and noil yields; skin wools, slipes and scoured wools; wastes and shippers’ lines; oddments such as overgrown, dead, black, etc.

9.63 Physiology

An introductory consideration of the following features of the physiology of animals will be presented. Emphasis will be placed upon the ruminant. As far as possible experiments to illustrate these will be carried out in the practical work:

- Physico-chemical structure of living matter.
- Physiological significance of physico-chemical phenomena.
- Permeability of animal cells.
- The animals water relationship.
- Digestive processes in animals—ruminant and monogastric.
- Respiration and physiological oxidations in animals.
- Animal heat regulation.
- Intermediary metabolism of carbohydrates, fats, proteins, etc.
- Secretory and accumulatory processes in animals.
Excretory processes and hormones and vitamins in the physiology of animals.

Physiology of growth and reproduction.

Excitation and inhibition of nerve, muscle and other animal tissues.

Function of the nervous system in animals. Reflexes. Receptors, including special senses.

Physiology of movement.

9.74 Fibre Science.


9.802a Wool I

(A course for students of Wool Commerce)

Theory and Practice


9.802b Wool II

(A course for students of Wool Commerce)

Theory and Practice

Introduction to yield. Wool classing—principles in special clips. Preparation of wool from various types of flocks. Recognition of wool types and assessment of quality number. Practical procedure for classing various types of clips according to district and wool type. Sorting of merino and crossbred wools to both length and quality. Wool scouring, carbonising.
9.803 Wool III
(A course for students of Wool Commerce)

Theory and Practice
Yield in relation to fleece wools and lower lines. Vegetable fault, its assessment and influence on price and manufacturing methods. Fault types and percentages. Wool broking, selling, cataloguing and auctioneering. Central classing, pooling, repacking, blending. Handling and processing (fellmongering) of sheep skins. Introduction to A.W.R.C. types and wool valuation. Wool sorting and wool classing (continued). Wool types. This year's work will include visits to wool stores, repacking houses, fellmongeries and wool scouring works.

9.804 Wool IV
(A course for students of Wool Commerce)

Theory and Practice

9.812 Sheep Husbandry
(A course for students of Wool Commerce)

The sheep industry of Australia and its place in the economic life of the Commonwealth.

The sheep areas of the Commonwealth, the inter-relationships of breeds and types and the natural, economic and artificial conditions determining the stratification of the sheep types.

Elementary anatomy and physiology of sheep.

Introduction to the breeds of sheep of importance to Australia. Aids to judging. Breeds, their uses and economic relationships.

Calendar of operations on pastoral, mixed-farming and intensive properties; flock compositions; purchase and sale of stock.

Sheep management—sheep classing, culling; purchase and care of rams; care and management of the breeding ewe; mating; lambing; lamb marking; shearing, crutching and wigging, weaning and management of weaners; drenching; dipping; mulesing; principal sources of loss and their control.
9.814 Sheep Production  
(A course for students of Wool Commerce)  
Products from sheep: wool, meat, skins, tallow and freezing works' by-products. Trends in production.  
Principles of animal production and their application to the sheep industry; reproduction and fertility, milk secretion, growth and development, nutrition, breeding.  
Cross breeding and fat lamb production.  
Factors affecting sheep production; pasture improvement; fodder conservation; supplementary feeding; drought feeding; water conservation; irrigation.

9.823 Wool Textiles I  
(A course for students of Wool Commerce)  

9.824 Wool Textiles II  
(A course for students of Wool Commerce)  

9.94 Genetics  
MATHEMATICS
Subjects 10.00 to 10.92 and Mathematics (Science)

10.11 Mathematics

Review and extension of matriculation algebra and trigonometry. Determinants, partial fractions, limits, convergence of infinite series, approximations.

The circular, exponential and hyperbolic functions and their inverses. Equations and limits involving these functions.

Derivatives and their applications. Indefinite and definite integrals. Approximation to the numerical value of a definite integral by Simpson's rule.

Quadrature, rectification, determination of volumes, means, moments, centroids and quadratic moments.

Partial derivatives, total differential and applications.

Taylor's and Maclaurin's expansions and their uses.

The co-ordinate geometry of the straight line and of such curves as are of technical importance, using Cartesian and polar systems of reference. Determination of linear laws and reduction of other laws to linear form. Use of logarithmic and other forms of graph paper.

First order differential equations of "variables separable" type and of "exact" type. Second order equations of the type $y'' + ay' + by = 0$.

Introduction to complex algebra.

10.11 Mathematics, Part I and Part II

In part-time courses offered in the Faculty of Engineering the subject 10.11 Mathematics is presented in two approximately equal courses over two years, the courses being designated 10.11 Mathematics Part I and 10.11 Mathematics Part II.

10.11b Mathematics

A special course in statics and dynamics integrated with the work in advanced mechanics and properties of matter which is taken in third term of first year Course I (Applied Physics), Course II (Applied Chemistry), Course III (Chemical Engineering), Course IIIa (Food Technology), Course IV (Metallurgy), Course VIIa1 (Fuel Technology) and Course XIII (Textile Technology).
10.11-B Mathematics, Part I and Part II

In part-time courses offered by the Schools of Chemistry, Chemical Engineering, and Metallurgy, the subjects 10.11 Mathematics and 10.11B Mathematics are combined and presented in two approximately equal courses over two years, the courses being designated 10.11-B Mathematics Part I and 10.11-B Mathematics Part II.

10.12 Mathematics.

A fuller treatment of 10.11 Mathematics with special reference to functions of more than one variable. Multiple integrals.

The Laplace transform and its use in solving linear differential equations. Introduction to partial differential equations.


Introduction to three-dimensional co-ordinate geometry. Lines, planes, and surfaces.


Introduction to Fourier series and harmonic analysis.

The general principles of dynamics and their applications.

10.12 Mathematics, Part I and Part II

In part-time and conversion courses offered in the Faculty of Engineering the subject 10.12 Mathematics is presented in two approximately equal courses over two years, the courses being designated 10.12 Mathematics Part I and 10.12 Mathematics Part II.

10.13 Mathematics

Statistical theory and its application to experimentation. Some special functions relevant to mathematical physics. Matrix algebra.

10.14 Mathematics

Selected topics in mathematical physics including some of the following: tensors, elasticity, boundary value problems, hydrodynamics, calculus of variations, numerical methods.

10.22 Mathematics

A course for students in Chemical Engineering.

10.20 Mathematics

10.30 Mathematics

Laplace and wave equations.

10.40 Statistics
A course in mathematical statistics for students in Civil Engineering.

Beta and gamma functions—the normal distribution function.

Fundamental statistical ideas (randomness, etc.). Introduction to probability theory.

Variate and univariate distribution functions (binomial, Poisson, normal, t, χ², F, etc.) and applications, largely to hydrological questions.

10.50 Mathematics
A course for students in Architecture.

Elementary plane and solid geometry treated largely from the analytical standpoint. The commoner properties of the conic sections.

Calculus: derivatives and integrals; their applications to maxima and minima, first and second moments, volumes, etc.

10.53 Statistics
A course in statistics for students in Industrial Engineering.

Basic probability theory. Simple applications with frequency interpretations—e.g., to choices of courses of action in circumstances dependent on unknown probabilities (i.e., introduction to “Operations Research”).

Standard univariate distributions: Poisson, binomial and normal, with descriptive rather than inductive applications: sampling inspection plans, specifications.
Sampling distribution related to the normal distribution ($\chi^2$, $t$ and $F$, in particular). Estimation: point (maximum likelihood) and interval (confidence interval). Applications to quality control techniques, accumulated tolerances.

Elementary regression, with a single controlled variable. Application to such questions as survey errors, effects of advertising, etc., from an elementary point of view.

10.62 APPLIED MATHEMATICS

A course in applied mathematics for students in Electrical Engineering.

Kinematics of a Particle

Time rate of change of vectors. Relative velocity and acceleration.

Dynamics of a Particle

General laws; range of applicability of Newtonian mechanics. Absolute and gravitational units. Work and power. Kinetic and potential energy; line integral and gradient of a vector. Simple harmonic motion; effect of dissipative forces; superposition of simple motions. Orbits under the inverse square law of attraction. Kepler's laws and Newton's deduction of the law of gravitation.

Plane Statics of a Rigid Body


Plane Kinematics of a Rigid Body

Translations and rotation, centre of rotation. Instantaneous centre, angular velocity. Space- and body-centrodes. The rolling of one lamina on another.

Dynamics of Material Systems


Elementary Hydrostatics

Use of Elementary Dimensional Theory
10.63 **Statistics**

A course in mathematical statistics for students in Electrical Engineering.

- Beta and gamma functions—the normal distribution function.
- Fundamental statistical ideas (randomness, etc.). Introduction to probability theory.
- Variates and distribution functions (binomial, Poisson, normal $\chi^2$, $F$, etc.) and applications, including an introductory treatment of regression, and the bivariate normal distribution. Autocorrelation.

10.73 **Statistics**

A course in statistics for students in Food Technology, Fuel Technology and Industrial Chemistry options.

- Introduction to probability. Random variables and standard distributions, including the sampling distributions of $\chi^2$, $t$ and $F$.
- Estimation.
- Tests of statistical hypotheses.

10.83 **Mathematics**

A course for students in Surveying.

- Method of least squares; weights, errors and residuals; multivariate correlation; finite differences; interpolation formulae. Further study of co-ordinate geometry of three dimensions, in particular the ellipsoid; elementary differential geometry; geodesies and geodesic parallels.
- Application of above to problems in surveying, geodesy, astronomy and photogrammetry.

10.91 **Mathematics**

A course in mathematics primarily intended for students not proposing to take further courses in mathematics, with a slight bias towards material relevant to subsequent statistical applications.

10.92 **Statistics**

A course in statistics for students in Wool Technology and Textile Technology.

- Fundamental statistical ideas (randomness, sampling, etc.). The standard elementary distributions: Poisson, binomial, and normal. Sampling distributions derived from the normal distribution ($\chi^2$, $t$-, and $F$-distributions) and standard tests based on these. Introduction to experimental designs and their analyses.
Science Course Subjects

10.1 Mathematics I

(Four one-hour lectures and two tutorial hours per week for three terms.)

Calculus and elementary functions.
Co-ordinate geometry.
Differential equations.
Dynamics.
Theory of equations.

10.2 Mathematics II (Pure)

(Three one-hour lectures and two tutorial hours per week for three terms)

Calculus.
Differential equations.
Fourier analysis.
Further algebra.
Co-ordinate geometry.
Vector analysis.
Special functions.
Elementary complex functions.

Higher Mathematics II (Pure)

Syllabus under consideration.

Mathematics II (Applied)

(Three one-hour lectures and two tutorial hours per week for three terms)

A treatment of mathematical techniques useful in mechanical, physical, biological and behavioural sciences and their application.

Higher Mathematics II (Applied)

Syllabus under consideration.

Mathematics III (Pure)

(Four one-hour lectures and two tutorial hours per week for three terms)

Algebra.
Real variable theory.
Differential geometry.
Foundations of Geometry.
Orthogonal functions associated with differential equations.
Matrices.
Functions of a complex variable.
Introduction to calculus of variation.

**HIGHER MATHEMATICS III (PURE)**

Syllabus under consideration.

**MATHEMATICS III (APPLIED)**

(Three one-hour lectures and two tutorial hours per week for three terms)

Extension of the work of Mathematics II (Applied).
Numerical analysis.
Statistics
Cartesian tensors.
Mechanics of continuous medium.

**HIGHER MATHEMATICS III (APPLIED)**

Syllabus under consideration.

**THEORY OF STATISTICS I**

Probability (elementary set algebra).
Variates (univariate, multivariate, expectations, moment generating and characteristic functions).
Standard distributions.
Sampling distributions.
Point estimation (moments, maximum likelihood, minimum $\chi^2$ etc.).
Confidence interval estimation, exact and approximate.
Elementary Neyman-Pearson theory of tests of significance, standard significance tests.
Regression (including curvilinear) on a single fixed variable.
Theory of Statistics II

Bivariate distributions and a sketch of multivariate theory.
Multiple regression.
Analyses of variance: random, fixed and mixed models, with powers; randomization tests.
Distribution free methods.
Stochastic processes.
A special project on a selected topic.
A selection of topics from:
  Sequential analysis.
  Theory of sampling.
  Bioassay.
Linear programming.
Response surfaces.
Further analyses of variances in experimental design.
Discriminant functions.
Theory of games.
The whole range of this subject has been divided into four sections. The first three sections (subjects 11.102, 11.103 and 11.104) are compulsory and taken by all students, whereas the last section (subject 11.105) is taken only by those students who elect to do so. It is presumed that these latter students have aptitudes for the structural design subjects of the course and also that they intend to practise it in some measure in their profession.

From this point of view the first four sections have been designed to cover the major portion of the field of structures as it affects the architect, but a certain amount of the work is intended to be dealt with descriptively rather than analytically. In the last section it will, therefore, be necessary to revise the early work, supplying the analytical proofs where necessary, and then proceed to the more advanced work in order to complete the field.

Supplementing the theoretical work there will be exercises in structural design and testing work in the testing laboratory (e.g., 8.22 Materials Laboratory).

11.102 Theory of Structures II


*Theory of Bending*—Fibre stress, horizontal and vertical shear, proof of formulae, relation between deflection and bending moment.

*Column Theory*—Short columns, long columns, slenderness ratio and eccentric loading, combined bending and direct stress.

*Structural Timber*—Properties, grading, permissible stresses, factors of safety.

- Design of beams and checking of stresses.
- Design of columns and checking of stresses.
- Design of floor systems including connections of members.
- Design of roof trusses with wind loading, bending and direct stress on upper chord, roof truss connection of members by bolting and ring connectors, roof systems.

*Footings*—Considerations and design for strip footings and isolated footings.
Retaining Walls—Arched, gravity, buttress, counterfort. Overturning, sliding, drainage, foundation pressure for cases when material retained is: water, granular, fragmentary, cohesive-clay.

Angle of repose, internal friction.

Concept of equivalent fluid pressure and surcharge.

11.103 Theory of Structures III

The study of structures in third year is concentrated on structural steelwork (riveted and welded construction) and reinforced concrete.

The sequence of lectures is arranged to provide the design information required by the student in carrying out problems in the Building Construction Class, and the information given precedes the class work so as to allow the student to determine size of structural element prior to commencing detailed drawing.

The influence on design by the Local Government requirements is discussed and all design is related to such requirements.

Structural Steel (riveted and welded construction)

Revision of work on properties of steel, use of rolled steel joists sections, plated sections, use of steel handbooks, properties of sections.

Steel Beam—Design, plated sections, lateral support, web buckling, stiffeners, and bearing. Design of joints, curtailment of plates, beam to beam and beam to column connections.

Steel Columns—Radius of gyration, lateral support, effective length, design of columns with concentric and eccentric loads, design of column plates, stool connections, cap and base plates, splices.

Steel Roof Trusses—Types of trusses, tyres of sections, design of members, joints and fixings, truss framing arrangement and bracing.

Reinforced Concrete

General theory of design, usual mixes and strengths, types of reinforcement.

Design of columns (concentric loads only). Rectangular and spirally wound, bar lists and reinforcement positioning.

Design of Beams—Free ended, fixed ended, continuous (using coefficients), web reinforcement, cantilevers, use of compression reinforcement. Beam theory, formulae, shear and bond stresses.
Design of slabs—One way, two way, continuous, placing of reinforcement, stair construction, retaining walls.

Design of footings—Unreinforced and reinforced types as governed by limiting dimensions, effect of base plate pressure on design.

General—Design effect of varying stresses in concrete by altering mix, increasing depth, varying stress in steel reinforcement.

11.104 and 11.105 STRUCTURES A AND B

The emphasis in fourth and fifth years is placed on the principles of design and facts governing the selection of types of structure for different building types rather than the detailed mathematical calculation which is kept to a minimum, particularly in fourth year.

11.104 STRUCTURES A*

The study of structural elements of the beam, column, truss, footing and slabs is developed to include the special and compound examples not designed in third year.

Examples of contemporary work in this field are examined with the object of determining the most suitable structure for given problems.

Detail study is applied to structural elements as follows:

Beams—Deflection, analysis of continuous frames by moment distribution method, fixing for temperature expansion, haunching.


Trusses—Special cases in timber, steel, and materials such as aluminium. Reinforced concrete trusses.

Footings—Bearing capacity in relation to short term and long term settlement. Seasonal movement.

Slabs—Flat slabs, deflection.

General—Prestressing, fireproofing, precast units, shell concrete, fatigue in structures.

11.105 STRUCTURES B (ALTERNATIVE TO 11.115 PLANNING RESEARCH)

Selected examples from the work treated in the fourth year are calculated and designed in detail and shop drawings prepared, with special attention to rigid frames in steel and concrete.

* In the new syllabus this subject will eventually be superseded by 11.74 Building Construction IV (Structures).
Further examples and study on: Curved beams, vicendral trusses, arches and domes, the shape of members or frames, materials best employed in given circumstances.

11.11 Descriptive Geometry.

This subject provides an introduction to general draughtsmanship. The student is taught the correct choice of drawing office materials, use of instruments, the elements of good lettering, geometric drawing, perspective and sheet composition. A good grounding in this work is essential in later years.

There are about thirty-two lecture-demonstrations followed by drawing. Each student is required to complete thirty sheets of drawings dealing with the following: Exercises in line drawing and plane geometry; lettering; orthographic, isometric, oblique, axonometric projection; theory of perspective, exteriors, interiors, inclined planes; shadows cast by geometrical features and simple architectural subjects on vertical and horizontal planes; shadows in perspective; solid geometry; development of intersections and surfaces; roof developments and layout; graphic symbols.

11.115 Planning Research

(Alternative to 11.105 Structures B)

Planning research is concerned with the study of buildings of architectural merit and of historic significance, and with the planning of buildings for contemporary needs.

Working in a group the student is called upon to do field investigations and prepare measured drawings. Concurrently with historical research the students prepare submissions which are intended to be lodged with a Reference Library.

In the third term considerable freedom is allowed the student in investigating subjects concerned with the graphic arts, philosophy of art and related interests, evidence being required of his own studies and reading. One or two advanced exercises in individual research may be given.

Each student is also required to conduct an investigation and present an address to his fellow students and to take part in general discussion.

11.125 Professional Practice

Subjects dealt with include:

Law of contracts; relationship of contracting parties and the architect; types of contracts; code of ethics; scale of professional charges; engagement and acceptance of instructions; statutory
controls (Acts, ordinances, regulations, by-laws, etc.); problems of practice; responsibilities of an architect; office administration; financial aspects (accounts, statements, variations, certificates); supervision.

Correspondence; relationship with specialist consultants; reports (property, dilapidations and project); copyright; insurances; litigation; study of articles of agreement.

11.135 Specifications

This subject extends over three terms with lectures in terms 1 and 2, and a specification assignment in the third term.

Details of lecture subjects are as follows:

Definitions; historical notes; purpose; legal significance; relationship to building contract; types; uses; aids; sources of information; language; format; reproduction; binding; methods of preparation; schedules; abstracts; “Master” and “Standard” specifications; comparative Australian, British and American examples; supplementary general conditions of “Preamble”; specifications of individual “Trades”; specifications for demolitions, alterations, additions and new works, individual and group.

11.145 Building Research Review

A series of lectures on the work of organisations in Australia and overseas engaged in research on problems related to building, including materials, structure and functional requirements.

Special attention is given to contemporary problems in building production, new materials and methods, prefabrication, preassembly, standardisation, dimensional co-ordination; relation of building regulations with new materials and methods; the use of research information by the practising architect.

11.164 Acoustics and Sound Insulation

During this period, the student is encouraged to study some specialised aspect of architectural planning and research, such as the latest developments in structural design or the engineering services of buildings, or specialised planning and equipment of buildings, such as hospitals, schools, etc. Some of this advanced study may be relative to the design projects being carried out under the heading of architectural design and construction, civic architecture or town planning, or the student may, with the approval of the Professor, pursue some avenue in scholarship, such as the literature of architecture, aesthetics or history, or the problems of architectural administration, professional practice, etc. This work will be embodied in a thesis to be submitted by the student within one of the following fields: (a) Architectural Design, (b) Building Science, (c) Administration. Each student has a supervisor to advise on reading, lines of investigation, etc. Importance is attached to the general presentation of this thesis.

11.186 Civic Architecture

In this subject research and practical problems are carried out, usually relating to improvement and re-development from a planning and architectural point of view, of parts of existing cities, such as Sydney and Newcastle and large country towns.

Civic surveys are made of the actual areas and all relative information is obtained by the students in groups, generally with the support of town planning officials in the city concerned, who indicate the basic economic, social and industrial conditions within which the student may have to re-plan and re-design the particular street or area.

A limited number of visits and criticisms are made by the Professor of Town and Country Planning of the University of Sydney discussing the work of the students in the principles and problems of civic architecture.

11.196 Town Planning

The course consisting of one term of lectures and one term of studio work provides an outline of the aims of town and country planning and its relationship to the techniques of architecture, civil engineering, geography, sociology, land economics and land surveying. The course also is preparatory to the post-graduate Diploma course in Town and Country Planning conducted by the University of Sydney. The course touches on the history, theory and practice of town and country planning and includes considerations of traffic and transportation, elements of civic design, the planning of residential areas and principles of regional planning.
11.203 Building Services and Equipment A.

Drainage, sullage disposal, septic tanks, sub-soil drainage, house drainage, by-laws, etc.; laying, joining and testing drains; ventilation of same; water supply, fittings and materials, water storage tanks, pumps, etc.; meters; fire services; sanitary plumbing; types of soil and waste fittings; design and installation of sanitary fittings, soil stacks, waste stacks, flushing systems, hospital and laboratory fittings and appliances; domestic layout including storage tanks, etc.

Gas service and domestic gas service and installation, appliances, flues, etc., heaters, stoves, fires, etc., refrigerators.

Hot water services of various kinds, solid fuel, gas, electric, separate and individual types, various appliances, hot water boilers and heating units; relative costs for different types of building.

11.204 Building Services and Equipment B

Generation and use of steam; sources of heat, combustion, selection of boilers; flues, stacks; layout of boiler rooms.

Hot water supply; types of calorifiers; hot water storage tanks, layout of plant; hot water boilers.

Heating of buildings; heat transmission through walls and floors, etc.; types of radiators, accessories, pipe systems; equipment and fittings.

Pumps; application to specific jobs.

Ventilation; natural and mechanical; air change, fans, ducts, registers; requirements of local authorities.

Refrigeration; refrigeration cycle; machines and accessories; location of plant; cool rooms, construction and insulation.

Air conditioning; description of sensible heat: latent heat, dew point, humidity, heat content of air; relation of aspect to head load, human occupancy, etc.

Fire protection; sprinkler systems; requirements of controlling authorities; fire extinguishers.

Lifts; application of lifts to buildings; types of lifts; requirements of controlling authorities; size of lift cars; size of walls; motor room; enclosures.

Lighting; natural and artificial; light intensity; requirements for lighting; types of lamps and fittings; calculation of lighting requirements; methods of installation; switch rooms, etc.

Call systems; application of call systems in hospitals, hotels, business premises, factories, etc.; telephones for intercommunication.
Kitchen equipment; items for kitchen equipment, their application and use; methods of operation, gas, electricity, steam, fuel oil, coal, coke. Servery equipment and accessories.

11.21A AND B AND 11.22 DRAWING, FREEHAND AND ARCHITECTURAL

In the first year, the drawing exercises are in two related phases—(a) freehand drawing and (b) architectural drawing; in the second year the freehand drawing is continued.

The student shall complete all work set during the course, which extends over two years, each of three terms' duration.

The practical work is intended to be carried out in the studio during each period. Each project is preceded by a brief lecture-demonstration and, where possible, projects are subject to display and discussion when completed.

11.21A FREEHAND DRAWING

The course is designed to teach the student to see intelligently, to aid facile expression of ideas and to develop in the student an awareness of the principles of linear drawing.

Practical work in various media is intended to develop perception and observation, a correlation between hand and eye, a gradually increasing skill in depictive power, an appreciation of the formal values underlying pictorial structure, and a skill in using the media with which he will be concerned. Exercises will include colour work and the properties of pigment.

Students are required to keep a sketch book as a supplementary project.

Subjects include—selection and care of equipment, general drawing, object drawing, quick sketching, memory drawing, outdoor sketching and studies, principles of free, perspective drawing.

11.21B ARCHITECTURAL DRAWING

This range of work introduces the student to the conventional forms of architectural drawing, scale drawing, architectural sketching, sketch designs, rendering, scigraphy, etc.

The student will have the discipline of drawing and rendering precisely architectural forms that are themselves precise, e.g., one or more of the Orders of architecture. He will be taught the different drawing techniques of the esquisse, the more formal sketch design, the correct presentation for a student competition, the small-scale working drawing, the detailed drawing, and the architectural perspective drawing, techniques in washes and effects in presentation. There will be some elementary exercises in general design. Some of this work will be linked with the Freehand Drawing, Descriptive Geometry and Building Construction I (Drawing).
11.22 Freehand Drawing II

Continuation of subjects set out in 11.21 at a higher level and extension to include elementary measuring and plotting in association with sketching buildings.

11.215 Estimating

Methods used for estimating: standard mode of measurement: profit, establishment and other on-cost charges: awards, insurance, taxes, etc.: scale of fees and charges by local and other authorities.

The subject matter for each trade or operation includes: current material prices; schedule of labour units. Memoranda in respect to: weights, mixing proportions and yields of materials, waste allowances, working costs and depreciation of plant, scaffolding, etc.: examples of “building up” the elements of a unit cost for pricing a bill of quantities; problems to work out using class examples for reference.

Measuring and methods of adjusting variations; grouping of unit item to obtain a bulked cost rate for different structural parts of buildings; comparison of costs for alternative methods of construction related to structural parts of buildings; preparation of preliminary estimates from sketch plans; tenders.

11.225 Architectural Administration

A series of lectures mostly by visiting specialists in the fields of job supervision and control, office administration, finance, accounting, business management, etc.

11.41-11.43 History of Architecture

This is one of the basic subjects related to Architectural Design, not because of possible present-day use of any plan or feature from the works of past masters, but for the reason that some knowledge of past systems of building, use of materials, principles of design, use of geometry and choice of form for purpose and beauty rightly should be understood. The place of architecture and visual environment in the social structure of peoples and their effect on the course of civilisation provide a useful and substantial part of the knowledge required by designing architects of this age.

The subject is treated in a wide manner, appropriate reference being made to significant events and conditions; the mass movement of peoples and the effect of military invasions; land and sea trading routes, lines of communication and the spreading of ideas; political, religious, social and economic influences; the work of the guilds and craftsmen.
The allied arts and minor crafts are considered as well as the masterpieces of architecture. Most examples are examined analytically in plan, external form, section and structure. The approach is critical rather than archaeological, the past affording examples of how recurrent architectural problems have been solved structurally and aesthetically. Some consideration is also given to urban planning, streets, grouping, gardens, etc.

Examinations are set at the close of each phase.

Commencing with the first year syllabus in 1958, the arrangement of lectures and studies in the History of Architecture will be as follows:

11.41 History of Architecture (General) will be a general historical review of man’s major achievements in architecture, building, town planning, etc., from the earliest times to the present day. In the second year commencing in 1959, more specialised and detailed study will be given to the following periods: Hellenic and Roman architecture; Early Christian, Byzantine, and Romanesque; Gothic architecture. In the third year commencing in 1960, the periods for special study will be the Italian Renaissance, French Renaissance, English Renaissance; the 19th and 20th Centuries, including Australian architecture; while the first term of the fourth year will be devoted to a careful study of the Modern Movement in Architecture.

The following description of the subjects gives the new syllabus for 11.41 History of Architecture (General) which commenced in 1958, while for 11.42 and 11.43 the old syllabus is given.

11.41 History of Architecture (General)

The field to be covered will include the ancient architecture of Egypt, Western Asia and Crete; the classical architecture of Greece and Rome; the Early Christian, Byzantine, and Romanesque periods; Mediaeval and Renaissance architecture and the various architectural developments that have taken place from the end of the eighteenth century to the present day.

Consideration will be given to social, political, religious, economic, geographical and climatic conditions which have influenced various places and periods and to development as a whole. These lectures will also serve as an introduction to the theory of architecture in the planning, form and function of buildings, the materials employed and the methods of construction adopted; to the influence that materials and construction have had upon design, with some reference to the effects of the growth of scientific and technical knowledge during the nineteenth and twentieth centuries.
These lectures on the History of Architecture will be preceded by the lectures formerly given as Subject 11.81 Introduction to Architecture and Building (six lectures, first term), which are taken by all freshmen to the School. They describe:

(a) How a building is produced; (b) the functions of the architect and related specialists—builders, quantity surveyors, structural engineers, etc.; (c) the structure of the building industry and professional and trade organisations in the industry; (d) brief description of the main subject matter which the student will have to undertake throughout the course: how one subject is complementary to another; (e) basic principles in architecture and building; the fundamentals in the course of study to which the student must pay particular attention.

11.42 HISTORY OF ARCHITECTURE II

Study of the evolution of church architecture of the Eastern and Western types and the rise and perfection of Gothic architecture.

Early Christian—The emergence of the basilican type of church building. Variations from the Roman type.


Romanesque—The development of Western Christian architecture. Experiments in form and construction towards ideal of a complete architecture in stone, including vaulted ceilings.


11.43 HISTORY OF ARCHITECTURE III

Architecture of the Renaissance in Europe.

Italy—Florence and the early Renaissance; the architecture of Venice; the mature Renaissance and Rome; Palladianism and the Baroque; planning and garden design.

France—Early influence of Italy; the architecture of the Loire; the evolution of the French chateau and landscaping; the unification of the arts under Louis XIV; French civic design.
England—Influences of the early continental craftsmen; Jacobean architecture; Inigo Jones and the unification of foreign elements; Wren and his school; Palladian influence and the Baroque; the development of the English house during the Renaissance; English contribution to planning.

History of architecture in the 19th and 20th Centuries. The Industrial Revolution and the Romantic Movement. The Age of Revivals; Archaeology and Medievalism; the Eclectics. The emergence of the engineer and the growth of specialisation; Art Nouveau and the Deutsche Werkbund; the development of the Garden City. Social changes and the development of Building Acts. New materials and new techniques. The evolution of the steel framed building, reinforced concrete; its influence on the development of free planning. Louis Sullivan and Frank Lloyd Wright; Le Corbusier and Cubism, the Villa and the Zeilenbau. The development of the house. The growth of the modern city.

11.51 BUILDING SCIENCE

This subject deals with the elements of structural design and with the physical and chemical properties of the major building materials. Emphasis is placed on testing methods as laid down in British and Australian standards, suitable tests being carried out in laboratory periods.

Chemical

Elements, compounds and mixtures.

Chemical changes and their laws. Symbols, valency, formulae and equations.

Properties of metals and non-metals.

Oxides, acids, bases and salts.

Oxidation and reduction, combustion.


Hydrolysis, ionisation, electrolysis.

Sulphur and its compounds, sulphates.

Chlorine and chlorides.

Carbon dioxide and carbonates. Limestone and lime; gypsum.


Metals, iron and steel, copper, tin, zinc, lead.

Aluminium and its alloys; brass and bronzes.
Physical

The porosity of building materials, absorption, permeability and capillarity. Weathering, efflorescence and decay. Methods of test.

Elasticity. Stress and strain. Tension, compression and transverse testing.

Thermal expansion and moisture movement.

Condensation.

Materials

Types of stone, their durability and uses.

Bricks, tiles and clay products.

Limes, plasters and cements.

Sands and gravels, grading curves.

Mortars and concretes.

Timber, structure, seasoning, moisture content, protection from insect and fungal attacks.

Properties and uses of the common metals.

Structures

Composition and resolution of co-planar forces; equilibrium of co-planar forces (both concurrent and non-concurrent); moments, couples and equations of equilibrium; force polygons and funicular polygons; forces acting on and determination of stresses in pin-jointed structures by graphical and analytical methods.

Shear in beams, determination of shear and shear force diagrams; bending moments in beams, and bending moment diagrams for beams: correlation of and relationship between shear and bending moments in beams; centres of gravity and centroids; moments of inertia and section modulus.

11.52 Building Science

Heat as a form of energy, its molecular movement and measurement. Ways in which heat affects homogenous and heterogenous solids and their relationship to thermal movement and stresses.

Factors affecting transmission of heat; conduction, convection and radiation. Low and high frequency radiations and their relationship to diathermanous materials.

Climate and its influence on design and construction. Australian climatic zones. Ways in which heat gains ingress to buildings and preventive measures. Thermal insulation, its advantages and disadvantages. Thermal capacity and the ways in which it may be used to advantage.

Theory of insulation and the relationship between molecular structure and conduction. Air as an insulator.


Sunlit surfaces and rise in temperature and variation due to colour and texture, with calculations.

Reflective insulation and its effect upon radiant heat.

Effects of moisture on thermal conductivity.

11.61 BUILDING TRADES AND CRAFTS

The general purpose of this subject is to familiarise the student with the materials, tools and terms used by the building craftsman and the interworking of building trades.

Specialist trade teachers give short lectures and demonstrations in the techniques of bricklaying, carpentry and joinery, plastering, plumbing, drainage and painting.

Each student is required to do some practical work which will include:

Preparation and mixing of materials; setting out work; laying bricks; jointing and bonding; construction of simple timber frames and methods of “building in”; plain cement rendering to wall surface and “running” a plastered mould; identification of fittings used by the drainer and plumber; practical drainpipe laying; soldering and riveting metal joints; fixing lead flashings; colour mixing; brushwork techniques for applying paint to different surfaces.

11.71 BUILDING CONSTRUCTION I

Lectures

Brief instruction on draughting techniques, projections and lettering.

Brick manufacture, types and qualities; bonding. Types and composition of mortars and their uses.

Footings and foundations and requirements of Local Councils and Ordinance 71. Trenches and timbering.

Cavity wall construction and treatment of openings.

Hardwoods and softwoods, conversion and seasoning; moisture content and shrinkage. Decay and defects.

Ground floor construction, timber and concrete and types of finishes. First-floor timber construction.

Fireplaces and flues and design requirements.

Flat roof construction with consideration of waterproofing and insulation. Types of floor coverings. Skillion and pitched roofs, sizes of members according to Ordinance 71. Suitable roof coverings and their methods of fixing. Chimney stacks and flashings to pitched and flat roof surfaces. Roof plumbing and materials used.

Timber-framed house construction, floors, walls, gable end details.

Weatherboarding and asbestos cement external covering.

Brick veneer construction. Joinery joints and applications. Types of doors and frames.

Functions and types of windows.

Stone, its selection and uses in building. Types of walling. Cast stone, terrazzo and terracotta.

Water collection and distribution.

Domestic plumbing and drainage according to Regulations.

Plastering, types of bases and precautions to be taken. Fibrous plaster manufacture. Acoustic tiles.

Paints and their components.

Glass manufacture. Types of glass and their uses.

Practical

Studio work comprises a number of half-imperial detail sheets done during first and second terms. These are designed to give the student practice at setting up a sheet and improving his draughting.

During third term the students have an Integration problem which correlates elementary design with constructional detailing in the form of working drawings of a simple building.
Lectures

The course comprises thirty-four one-hour lectures covering the following points of construction:

Timber stairs; cupboards and storage walls; large glass areas; building site assessment and preparations; footings; piling and rafts; demolitions; excavations; shoring; underpinning; basement construction; water, moisture and damp-proof walls; theory, preparation and handling of concrete; pouring of concrete, formwork; theory of reinforcing of concrete, brickwork and masonry, placing of reinforcement; roofing of large areas; heavy timber construction; load bearing brick walls; warehouse construction; fire resisting construction; curtain walls; wall facings and finishes (internal and external); floor surfacings.

As it is impossible to cover all points in connection with any topic under discussion in the time available, each lecture is supplemented with a detailed list of references.

Practical

The work for the year consists of five sheets of detailed drawings and five sheets of working drawings, of imperial size, exemplifying the subject matter of Building Construction Theory II. The actual problems set cover mainly:—Joinery, advanced domestic construction, heavy timber construction, heavy footings, load bearing brick walls and the roofing of large areas. Particular attention is paid to the correct method of executing working drawings and all work is to comply with relevant by-laws and regulations.

11.73 BUILDING CONSTRUCTION III

Lectures and practical periods for the study of advanced constructional work beyond that of years I and II.

Advanced building detailing, building layout as affected by Local Government regulations, Sydney Corporation Act By-laws 51 to 58 inclusive.

Ordinary and fireproof construction, curtain walls, stairways, lifts, light wells. Consideration and detailing of problems met in framed construction, both steel and reinforced concrete.

Economical frame layouts and relationship to architectural plans and design. Detail drawings of wall sections, special facings, flashings, flat roofs, drainage, parapets, fireproofing, internal finishes, etc., and working drawings of multi-storey frame buildings, design and detailing of structural elements in steel (riveted and welded work) and reinforced concrete following the lectures in 11.103 Theory of Structures.
The working drawings and details of a multi-storey frame building are required to be done for an Integration problem which is treated in the Design class for some of the architectural design aspects.

11.82 Theory of Architecture A

Basic functions of buildings; clients' needs and programme of requirements; functional planning, scientific structure, beautiful appearance; introduction to planning; scientific study of requirements; processes in determination of plan; circulation; process diagrams in planning; site and surroundings; study of various sites and how they affect the building; prospect, aspect, orientation; drawing up a programme of requirements; requirements and human need; locality, structure economy, historical and contemporary structure; classical and contemporary plan composition; symmetry and asymmetry; decisive plan forms; proportioning of plan units; principles of architectural composition; aesthetic theories; modes of thought; buildings as organisms; visual art, unity, duality, contrast, rhythm, proportion, scale, character; verticality, horizontality; the dominant, major and minor features; major and minor focal points; composition of masses; space enclosure in three dimensions; the element of decision; accentuation.

Studio exercises in the principles of architectural design.

11.82a Theory of Architecture

A series of lectures designed to familiarise the students of Civil Engineering with the nature and evolution of architecture, contemporary design and construction, and the work of the architect.

Lectures deal with:

Influences affecting the evolution of architecture; Egyptian, Greek, Roman, Gothic, and Renaissance architecture; Australian architecture; the development of contemporary architecture and contemporary structure; structure in architectural design; the elements of design; drawings and documents made by the architect; collaboration with consultants.

11.83 Theory of Architecture B

Broad factors influencing architectural design: people, climate, topography, materials, economics, social system, etc.

Atmosphere and character.

Expression of function, structure and materials. Relationship in massing and detail.

The importance in architecture of space as well mass.

Design of external space.
The detailed equipment of space: street furniture, site furniture, paving and growth; elementary landscape study.

The design of building groups.

Approach to an architectural problem, from simple to complex; planning analysis.

Design for climate.

Sun control, natural lighting.

Architectural detailing: shop and assembly techniques and aesthetic problems involved.

11.93-11.96 Architectural Design and Construction

This range of subjects embodies and applies all the subject matter of the other lectures and studies in the Architectural course. Architectural Design includes planning, construction, specialised building techniques, engineering services and equipment, specification, estimating and building job supervision and control.

The whole course consists of a series of practical problems in design in the studio and at home in part-time periods, generally accenting fundamental aesthetic and technical points but with problems interspersed expressly to stimulate imaginative thinking.

In all problems, structure and construction are considered an essential part of design. In many cases special or unusual points in design are required to be substantiated by drawn details of construction. At least once in the latter end of the course structural calculations and details of construction are produced for a large building.

All work is marked by a jury, with class criticism and discussion.

11.93 Architectural Design and Construction A

Following earlier studies in structures, construction and aesthetics the student is in a position to attempt the application of these faculties in the design of buildings, firstly in the imaginative solution of architectural problems along the broadest functional, structural and aesthetic lines, that is the search for the essence of architecture. As the course proceeds, more precise and complete solutions are expected in all these fields.

The essential relationship between environment, site and building is emphasised from the beginning, as is also a sensitivity to appropriate form for purpose and structure and to development of architectural character.

At the end of the year an "integration problem" is undertaken in which the design of a simple building is taken on into working drawings.
In this year an imaginative approach to all problems is encouraged and theoretical justification for structure is not expected. Application of the fundamentals of architectural "presentation" covered in previous years is aimed at in the presentation of all design submissions.

11.94 Architectural Design and Construction B

Studio assignments on the design of buildings a little more intricate in planning and taken to a somewhat further stage of completeness in overall design, detailed planning and a consideration of structure, construction and materials.

Imaginative approach to all problems is sought, though by the end of the year structures are expected to be reasonable in concept, and construction and materials may need to be clarified in large-scale details.

In the third term a series of lectures is given on furniture and interior decoration, including the aesthetics of interior finishes, furniture and furnishings, colour and texture, and a design problem is undertaken covering this field.

Where possible in this and succeeding years problems are set for actual sites.

11.95 Architectural Design and Construction C

Problems are undertaken in advanced planning, involving considerable traffic, both vehicular and pedestrian, planning for typical industrial processes, commercial buildings, housing work, etc. Associated questions of economics, structure, mechanical equipment and services are studied. Some of the problems are given to introduce group building design, urban design and elementary town planning.

In this year the aim is the correlation of all major aspects of the design of buildings, that is practical planning, structure, construction, economy, and the provision of fine human environment.

11.96 Architectural Design and Construction D

Large architectural projects, relative to actual sites and involving considerable research into human and community requirements and the problems of structure and mechanical and other equipment associated with large buildings; problems in specialised buildings to fit the present and future needs of the developing community.
APPLIED PSYCHOLOGY

Subjects 12.00 to 12.95

12.01 Psychology I

Three hours per week of lectures and practical work.

This course may be the only contact many students have with psychology. It is therefore planned to be appropriate to the largest number of students as well as a suitable introduction to more advanced work. The topics to be studied are the subject matter and methods of psychology, the biological and social determinants of behaviour, the basic processes of development of personality, motivation, perception, thinking, learning, individual differences, ability, the organisation of behaviour in the adult, adjustment, a suitable introduction to more advanced work. The topics to be studied are the subject matter and methods of psychology, the biological and social determinants of behaviour, the basic processes of development of personality, motivation, perception, thinking, learning, individual differences, ability, the organisation of behaviour in the adult, adjustment, an analysis of selected life situations—marital adjustment, vocational adjustment, adjustment to age. Throughout the course attention will be given to the nature and kind of methods used in psychology, observation, experiment, measurement, the function of hypotheses, verification of hypotheses and causation.

12.012 Psychology

A course for students in Industrial Engineering.

This course is a general introduction to Psychology, with special emphasis on individual differences, perception and motivation. It includes biological and social determinants of behaviour, personality development, motivation, ability, perception, thinking, learning, memory, vocational adjustment and adjustment to age.

The theory is illustrated throughout by reference to industrial applications.

12.02 Psychology II

Two lectures and two periods of practical work per week.

The course provides for detailed study of the fields of motivation, perception and learning. In addition, an experimental course is provided which includes the usage of apparatus and instruments and a series of lectures on scientific method and experimental design.

12.02A Psychology II

Two hours per week.

A course in Psychology for students of Textile Manufacture, based on the subject matter of 12.02.
12.03 Psychology III

Three lectures and one hour of practical work per week.

This course aims to consider theories of personality and the criteria for the evaluation of personality theory. It should assist the student to develop a theory of personality which he can apply to his work. It considers the empirical aspects of personality as related to theories. Such topics as types of personality, cultural background of personality, factor analysis and personality, patterns of personality development and personality and adjustment problems are included. Practical work will include reworking experimental data basic to some of the theories.

12.03A Psychology IIIA (Industrial Relations)

Two hours lectures per week.

The general theme of this course will be the person in industry. It will include discussions of the nature of personality, theoretical approaches to the study of personality, social influences on growth of personality and descriptive treatment of psychopathology.

12.09 Mathematics for Psychology

Three hours per week.


Rectangular Cartesian and polar co-ordinate systems with applications.


Functions of several variables; partial derivatives.

12.10 Psychological Assessment I

One lecture and two hours practical work per week.

The course consists of:

The logical aspects of measurement: the role of measurement in modern science, uses of mental measurement. The nature of fundamental units, derived units. Kinds of criteria for measuring the validity of various kinds of tests, objective and subjective criteria used to measure tests of achievement, general aptitude, special aptitude, interests, attitudes and personality. The construction of quality scales and their use as validity criteria; the composite criterion.
Types of job analysis and their use as criteria. Factors affecting the use of criterion measures.

Reliability—analysis of variance. Understanding of true score, errors of measurement, index of reliability, influence of range of talent on coefficient of correlation. The concept of optimum administration time as related to validity and reliability. The relation of the distribution of item difficulty and item discrimination to validity and reliability.

Item construction: problems of sampling; a consideration of the mental processes involved in answering various types of items. Scoring devices: formulae for correction of chance success; weighting test scores according to dispersion, reliabilities and validities. Rating scale methods: optimum number of scale units; types of scales for various purposes; errors in rating. Interpretation of test scores and ability patterns.

12.11 Psychological Assessment II—Industry

One lecture and two hours practical work per week.

Measurement of individual differences. Test theory; intelligence tests—uses and limitations. Primary mental abilities. The growth and decline of intelligence. Achievement, aptitude, interest, personality and trade tests used in selection and assessment. The use of questionnaires, rating scales, inventories, cumulative records in the measurement of work effort, responsibility, productivity and motivation. Group methods of selection and management. Interviewing; different types of interview. Interpretation of results, case analysis, differential occupational ability patterns. The employee selection ratio and critical scores.

12.11a Psychological Assessment IIIa—Counselling

One lecture and two hours practical work per week.

12.20 Psychology IV—Social

Three hours lectures per week.

This course will take up the general problems of social behaviour and the relationship of social psychology to psychology on the one hand, and to the various social sciences on the other. It will discuss the theory of institutions, groups, and social movements, social controls, group pressures and standards, conformity and social norms. The importance of status, role, behaviour, communication, rumour, attitude formation and the various mechanisms of social expression will be investigated. The relationship between character, society and culture, studies in the authoritarian personality, ethnocentrism, prejudice and theories of leadership are topics included in the courses.

12.21 Psychology V—Applied Social

Two hours lectures, two hours practical work per week.

The course will include the following topics:

Theory—Supervision: leadership and power relation in industry; industrial motivation; morale dimensions; dynamics of social change and industrial behaviour; the field of human relations. Psychological features of human relations. Mechanism in social interaction exemplified in various consultative situations. An examination of British and American studies in group dynamics and human relations programmes.

Practical—Systematic observation of spontaneous social occurrences. Systematic observation of group phenomena. Experimental studies on group influence on skills and the communication of attitudes.


12.30 Industrial Psychology

Two hours lectures per week.

This course deals with the adjustment of the individual to the work situation.

A. Work as part of a Pattern—Acceptance of work. General treatment of problems of incentives and absenteeism, personal and group efficiency.

B. Environmental Conditions Affecting Work Behaviour—Lighting, ventilation, colour, temperature, etc.

C. Physiological Conditions Affecting Work Behaviour—Physique, posture, movement, motor co-ordination, speed, span of perception, fatigue.

INDUSTRIAL AND LABOUR RELATIONS

Three hours lectures per week.

I. Industry as a Complex Social Organisation

The Development of Modern Industry—The factory system and its forerunners. Factory production. Capitalism, science, and technology; individualism and the division of labour. The growth of professional management. The development of Australian industry.

The Industrial Community—Interdependence of industry and community. Types of industrial communities. Effects of community values on personality development, e.g., mining.


Social Controls of Industry.

II. Problems of Planning.


III. Labour Relations

The Nature of Labour Relations—Industrial and population distribution, social and economic objectives, types of labour problems—social, political, psychological and economic. Historical background.


Labour Legislation—Labour standards, wage and hour regulations, arbitration, workers’ compensation.

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12.40 Personnel Techniques

One lecture and three hours practical work per week.

In this course, students learn through practice many of the techniques described in other courses—the development of a personnel programme, job analysis, job description. Demands of occupations on the individual. Unit of work, selection, training and promotion.

12.40a Psychology Vb—Counselling Techniques.

Two lectures and four periods of practical work per week.

The purpose of this course is to give first-hand acquaintance with the techniques of counselling and to develop the skill to use them with individuals in need of counselling.


12.44 Occupational Information

One lecture per week.

This course aims to give a realistic background of information concerning occupations and industries. In the first section a study is made of the literature and in the second section the student develops occupational and industrial information by observation in the field.

Topics will include jobs and industries classification, and obtaining facts by job analysis. The necessity of obtaining facts first-hand by observation. Preparation of job information for counselling—job descriptions, job families, occupational trends. Patterns of jobs in individual establishments, flow of work, promotional sequences, relationship of jobs to the functions of the firm.

12.70 Psychology IVb—Principles of Counselling

Two hours lectures and two hours practical work per week.

The scope of counselling work in industry, education and the public service. The counselling function in a modern community. The assumptions and philosophy of counselling. Theories of counselling and psycho-therapy. Counselling services. The analysis of counselling records. Counselling as a learning process. The purpose

12.91 Psychology I (Commerce)
Two hours per week.
This course is a general introduction to Psychology, with special emphasis on individual differences, perception and motivation. It includes biological and social determinants of behaviour, personality development, motivation, ability, perception, thinking, learning, memory, vocational adjustment, marital adjustment and adjustment to age.
Practical work will illustrate the theory.

12.92 Psychology II (Commerce)
Two hours per week.
This course involves a study of the individual worker and the organisations in which he works. It is concerned with the study of 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 theory and practical work.

12.92A Psychology IIa (Industrial Relations)
Two hours lectures per week
This will be a special course examining those psychological elements which underlie industrial relations. It will include a discussion of motivational and attitudinal factors, learning processes and perception with special reference to their social application.

12.93 Psychology II (Education)
This course aims to study child growth and development, the process of learning in children and adults, and the importance of group behaviour for education.
Associated with the theoretical treatment will be a discussion of the skills and techniques used in the classroom and observation of teaching at various levels.
12.94 Applied Psychology

(A Course for Students of Hospital Administration)

This course is designed to introduce students to the principles underlying human behaviour and the application of these to the work situation. The theoretical training will be linked with personnel techniques, personnel administration and industrial relations. The first two terms will provide a general introduction to psychology, with special emphasis on individual differences, perception and motivation. It includes biological and social determinants of behaviour, personality development, motivation, ability, perception, thinking, learning, memory, vocational adjustment, marital adjustment, and adjustment to age.

The third term will study the individual worker and the organisation in which he works. It is concerned with the study of job success and failure, job satisfaction and dissatisfaction, industrial motivation, employer-employee relations, acquisition of job skill, conditions affecting job efficiency and the like.

12.95 Psychology IVa (Industrial Relations)

Two hours lectures per week

This will have for its main theme industrial relations and industrial conflict. It will include discussion of the psychological factors involved in industrial organization, the relationships between executives and operatives, the group dynamics of the factory and the general cultural climate of Australian industry. Some treatment will be also given to the more common personnel techniques, and if time allows, practical work in interviewing will be included.
TEXTILE TECHNOLOGY
Subjects 13.00 to 13.93

13.12 TEXTILE TECHNOLOGY I

(a) Textile Raw Materials

An outline of the history, sources, growth, grading, sorting, marketing, statistics, properties and uses of the natural textile fibres; genetical considerations. Fibres studied in detail are cotton, flax, jute, wool and silk. Re-manufactured materials.

A brief description of the production of the man-made fibres, their statistics, properties and uses.

An outline of the histological structure and formal characteristics of fibres and filaments.

Samples of a wide variety of textile raw materials will be issued to students for examination.

(b) Yarn Manufacture

Yarn requirements and formations. Yarn numbering systems. Essential properties of yarn raw materials.

Introduction to yarn manufacturing systems. Principles and practices in removal of fibre impurities, blending and opening processes, carding and combing, with detailed reference to the cotton, woollen and worsted systems. Machinery construction, settings and processing calculations.

Practical demonstrations and assignments in yarn manufacture up to and including combing.

(c) Fabric Manufacture

Principles and practice of winding, warping, sizing, and healding. Principles of the main types of weaving mechanisms; loom accessories; loom timing and tuning; warp and weft tension; shuttle flight. Automatic, shuttleless and circular looms. Production of narrow fabrics. Cloth defects and quality control in weaving. Practical assignments and demonstrations in weaving.

(d) Fabric Design and Analysis

The study of the general principles of textile design; single and backed cloth structures; drafting and pegging plans; knitted structures.

Colour theories and application of colour. Studies leading to the appreciation of good design.

Dissection of fabrics to determine yarn structure, weave and finish. Analysis of finished materials to permit fabric reproduction.
(a) **Yarn Manufacture**
Principles and practices in drawing and spinning, twisting and winding.
Special features of the rarer yarn manufacturing systems.
Quality control in yarn manufacture with special reference to assembly irregularity and control.
Yarn manufacture research and development.
Practical work on drawing and spinning machinery.

(b) **Fabric Manufacture**
Cloth setting theories; cloth costing; loom efficiency. Weaving developments and research.
Principles of the important knitting methods. Defects and quality control in knitting. Knitting developments and research.
Manufacture of felted and bonded fabrics.
Significance of the mechanical properties of fibres and yarns in fabric production.
Practical assignments and demonstrations in knitting.

(c) **Textile Testing**
Statistical techniques in textile testing.
Physical testing of fibres, yarns and fabrics, with particular reference to standard and experimental methods used in industry. Chemical testing of fibres, yarn and fabrics. Testing of textile auxiliaries.

(d) **Advanced Fabric Design**
The use of specific fibre and yarn properties to produce speciality fabrics; tapestry, gauze and plush type fabrics; carpets and felt structures.

(e) **Textile Finishing**
The causes and prevention of defects in bleaching and finishing.
(f) **Textile Dyeing**


Effect of variation in physical and chemical properties of fibres on dyeing; effects of variations in industrial dyeing techniques.

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13.14 **Textile Technology III**

(a) **Yarn Manufacture**

Advanced studies of yarn manufacture from the standpoint of fibre disentanglement, mixing and subsequent re-entanglement. Proposed theories and experimental observations in carding, blending and combing.

Measurement of forces in drawing and spinning; theories of drafting.

The significance of the rheological properties of fibres and fibre assemblies in yarn manufacture.

Experimental work with laboratory and industrial equipment.

(b) **Textile Finishing**

The significance of the rheological and other physical properties of fibres and fabrics in finishing with particular reference to the effect on these properties of mechanical and chemical processes.

Advanced studies in finishing, including research and development.

(c) **Textile Dyeing**

Theories of dyeing. Dye-stuff testing and evaluation.

Colorimetry; colour matching and combining. Textile printing processes.

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13.23 **Textile Science I**

(a) **Textile Physics**

Viscoelastic properties of textile fibres and filaments in tension, bending, shear and torsion; effect of ambient conditions; creep, relaxation and recovery; stress-strain-time properties in rupture; repeated stress behaviour; infrasonic, sonic and ultrasonic properties.

Yarn and fabric geometry.

Rheological properties of fibre assemblies; interfibre friction; frictional properties of yarns and fabrics.
Moisture transmission, water repellency and resistance. Thermal properties of fibres; thermal transmission properties of textile structures.

Physics of end-use behaviour such as dimensional stability, crease retention, wrinkle resistance, abrasion and wear resistance, fabric soiling, stiffness, handle and drape.

Optical properties of textile fibres and fabrics.

Electrical properties of textile fibres and assemblies.

(b) Textile Chemistry

Chemical constitution of the natural, regenerated and synthetic fibres, and other high polymers.

Chemistry of textile auxiliaries, including methods of analysis and evaluation.

 Reactivity of the various textile fibres and filaments with chemical reagents of industrial significance.

13.24 Textile Science II

(a) Textile Physics

Introduction to fine structure of textile fibres; morphology and histology; macromolecular structure.

Molecular structure; X-ray and infra-red interpretation.

Relationship between molecular structure and mechanical behaviour; phenomenological approach; molecular models.

(b) Textile Chemistry

Proposed chemical interpretation of the molecular structure of solid high polymeric materials. Effect of differences in chemical structure on mechanical and other physical properties.

Advanced treatment of the chemical technology of certain textile processes.

Microbiological properties of fibres.

13.33 Textile Engineering I

Introduction to methods engineering; textile mill location, design and layout; time and motion study. Introduction to textile costing.

Prime movers and power transmission in the textile industry. Production, utilisation and properties of steam; factory lighting, heating and air conditioning; electric motors; industrial instrumentation.
13.34 TEXTILE ENGINEERING II

Mechanics and design of textile machinery; lubrication; noise reduction.

Engineering design of textile structures for particular end-uses. The industrial significance of the mechanical properties of textile fibres and assemblies. Configuration, strain and stress analysis of single fibres in textile processing; yarn manufacture from the standpoint of mass flow and its control.

13.92 GENERAL TEXTILES (YARNS)

A course for students in Wool Technology

An outline of the history, sources, growth, grading, sorting, marketing, properties and uses of the natural textile fibres (excluding wool). A brief description of the production of man-made fibres, their properties and uses. An outline of the histological structure and formal characteristics of fibres and filaments.

Introduction to yarn manufacturing systems. Principles and practices in removal of yarn impurities, blending, opening, carding, combing, drawing, spinning and twisting for cotton and wool systems, with detailed reference to processing wool and blends of wool with man-made fibres.

13.93 GENERAL TEXTILES (FABRICS)

A course for students in Wool Technology


The study of the general principles of textile design; single and backed cloth structures; drafting and pegging plans.
ACCOUNTANCY
Subjects 14.00 to 14.53

14.11 Accounting I

Two hours lecture and two hours tutorial weekly.

This course, which must be taken by all students reading for the degree of Bachelor of Commerce, aims to define the purpose and functions of accounting, to show the application of generally accepted accounting principles and how accounting information may be used by management as a basis for business decisions.

The course will be in four main sections, viz: (a) basic theory; (b) historical recording; (c) comprehension and interpretation of accounting data and reports, and (d) introduction to managerial accounting—the provision of information useful to management in the formulation of its policies and in the evaluation of current performance.

The syllabus will cover the recording of transactions and the preparation of income statements and balance sheets of sole traders, partnership firms, corporations and non-trading concerns. Students will also be given an introduction to management accounting, including topics such as budgeting and budgetary control, analysis and interpretation of accounting reports.

14.11A Accounting

A course for students of Industrial Engineering based on the subject matter of 14.11 Accounting I.

14.11B Seminar in Accounting

A course for students of Hospital Administration based on the subject matter of 14.11 Accounting I.

14.12 Accounting II

Two hours lecture and two hours tutorial weekly.

This is a course in financial accounting, dealing especially with accounting records on an historical basis as distinct from industrial and cost accounting. It covers accounting method as applied to the accounts of sole traders and partnerships, joint ventures, branches, pastoral and rural enterprises, unsystematised (single entry) recording, deceased estates, fire losses and loss of profits insurance, and accounting for commodity stocks; accounts of trustees and bankrupt estates.
14.13 Accounting III

Two hours lecture and two hours tutorial weekly.

This course covers all aspects of corporation accounting as well as certain selected aspects of advanced financial accounting.

Detailed treatments include company formation, reconstruction, mergers and liquidation; debentures, receivership; published accounts and reports of companies; mining, insurance and banking companies; holding companies and group accounts; provisions, reserves, reserve funds and secret reserves; the double account system; hire purchase and instalment purchase accounting; valuation of shares and goodwill; depreciation accounting; the impact of price level changes on conventional accounting methods.

14.14 Accounting IV

Two hours lecture and one hour tutorial weekly

This is a general course in management and industrial accounting and covers the analysis and interpretation of financial and operating statements; an introduction to cost accounting; manufacturing statements; accounting for material, labour and expense; the integration of financial and cost records; job costs; process costs; joint and by-product costs; standard costs; cost analysis; the relation between costs, volume and prices; break-even analysis; profit control; differential costs; budgets and budgeting, including reference to the Commonwealth and State budgets; accounting systems; classification in accounting; mechanised accounting, including electronic data processing.

14.15 Accounting Control

One hour lecture weekly.

This course will examine the accounting aspects of Internal Control and will be integrated, as far as possible, with Statistical Methods II.

It will cover the design and maintenance of an efficient accounting system for managerial control and will include special topics such as the control of expense, inventories, sales, receivables, fixed assets, cash, investments, liabilities, finance and decisions to make, lease or buy.

Various control tools, including budgets, standard costs and internal audit will be examined. Emphasis will be given to the methods of communication of control information to management by means of periodic reports.
14.15a Accounting Control

A course for students of Industrial Engineering.

This course will deal with budgeting and budgetary control and with the control of costs and expenses through the use of accounts. In particular, it will cover production, administrative and distribution expense control, control of inventories, investments, fixed assets, and sales, costing control, profit planning and control.

14.16 Advanced Cost Accounting

(Pre-requisite—Accounting IV)

Two hours lecture and one hour tutorial

This course is designed to give an intensive coverage of the principles and applications of cost accounting and budgeting, particularly as applying to industrial organisations. It includes the evolution of cost accounting; developments in technique; cost concepts; incentive plans; classification and analysis of expenditure; setting standards; advanced standard costing; marketing and administration costs; technique and procedure of budgeting; profit planning; preparation of monthly accounts; reports to management; direct and marginal costing; installation of systems and work simplification; uniform costing; industrial and commercial organisation.

14.161 Accounting Seminar

The work of the seminar will include discussion of contemporary problems in accounting; the relation of accounting to economics and finance; and the status of accounting as a profession in a changing economy. It will also include a critical analysis of accounting theory.

Students will be required to present papers on approved topics.

14.23 Auditing

One lecture of two hours weekly

This course will be integrated with accounting where practicable and will cover the principles of auditing, auditing procedures, vouching, checking, the verification of assets and liabilities, the development of audit programmes, investigations, auditors and investigators' reports. The course will deal also with internal control, its nature, scope and significance to the auditor, internal auditing, trends and developments in the profession, the evolution of auditing standards, professional ethics, statute law and case law decisions affecting auditors.
14.33 Taxation Law and Practice

One lecture of two hours weekly

The major part of the syllabus is concerned with a detailed study of the Income Tax Assessment Act, the determinant of income, the assessment of specific forms of income, allowable deductions, both in a general and specific sense, the assessment of different classes of taxpayer and the machinery provisions of income tax collection.

There are also lectures dealing with land tax assessment and collection, pay-roll tax and sales tax.

14.41 Law I

One hour lecture weekly

This course commences with an introduction to the system of law in Australia, with particular reference to the sources of law in New South Wales, the importance of judicial precedent, elementary principles of legal interpretation and a short history of the development of mercantile law.

The particular topics included in the syllabus are: the law of contract; sale of goods; agency; guarantees; hire purchase; bailments and common carriers.

14.42 Law II

One hour lecture weekly

The principal aspects of commercial law not dealt with in Law I form the syllabus of this course. These are: negotiable instruments; the law of partnership; insurance law; commercial and industrial arbitration; deceased estates; duties of executors and trustees; the law of personal property, including references to gift duties and stamp duties on disposition thereof.

14.43A and 14.43B Law III

One lecture of two hours weekly

This subject consists of two parts—

Part A: Bankruptcy Law

This includes an analysis of the acts of bankruptcy, debts provable in bankruptcy, property available to creditors, avoidance of settlements and discharge of bankrupt persons.

Part B: Company Law

This includes a study of the Companies Act, 1936, with particular emphasis on formation and registration of companies, memorandum and articles of association, share capital, membership, reconstruction, amalgamations and winding-up.
14.52 Business Finance

One lecture of two hours weekly

This course will be concerned with the question of funds, their deployment and control and the disposition of earned surpluses. It will deal with short and long term finance from external sources and financing by retention of earnings. Attention will be given to the problems associated with and techniques to be followed in raising capital, the control of funds once obtained and the factors to be considered in determining a sound reserve and dividend distribution policy. The relevance of conventional accounting techniques for the control of business finance will also be examined.

14.53A Production

One lecture of two hours weekly

This course is designed to familiarize non-technical students with production processes and organizations. Topics will include the development of modern industry, fundamental principles of management organization, principles of manufacturing, plant location and utilization, factory buildings, production planning and control. The course will be integrated, as far as possible, with the study of cost accounting.

14.53B Marketing

One lecture of two hours weekly

This course is designed to acquaint students with the problems associated with the marketing of products and services. It will cover the analysis of the problems of distribution, merchandising and all aspects of selling.
ECONOMICS
Subjects 15.00 to 15.34

15.11 DESCRIPTIVE ECONOMICS

Two hours per week including tutorial classes.

The aim of this course is to acquaint the student with the organisation and operation of the Australian economy. It studies the factor endowment of Australia in terms of human resources (labour), mineral and agricultural resources (land), and the results of past economic activity (capital).

The course proceeds through an analysis of Australia’s national income, to examine the operation of particular sectors of the economy including the Australian financial system. The final section of the course is devoted to Australia’s external trade.

The examination will consist of one three-hour paper.

15.111 SEMINAR IN ECONOMICS

A course for students in Hospital Administration.

This seminar course will provide an introduction to economic analysis for students who have not hitherto studied the subject. In addition, economic principles will be used to analyse contemporary problems of economic policy such as the control of inflation, the maintenance of external equilibrium and the development of Australian productive capacity.

15.114 ECONOMICS

This course will consist of two related parts. The first part (of approximately thirty-six lectures) will constitute a broad survey of the subject matter of economics. In more detail the contents will include a discussion of the economic problem and the general problem of resource allocation; the function of the price system; the national income and the national income accounts; a sketch of elementary employment theory; and a brief mention of business cycle problems and problems of economic policy. In the main, therefore, the first part of the course will be devoted to macro-economics.

The second part of the course is designed to give students an insight into the problems facing individual firms within the context of a modern capitalist economy. It will discuss such matters as the allocation of factors by the firm; the pricing of products in different market situations; the legal and other bases of monopolistic positions; the influences making for and inhibiting growth; and the problems of the social control of industry.
15.12 Economics I

Two hours per week including tutorial classes.

This course provides an introduction to economic analysis. It begins with a general account of the major problems of economics and a short account of the methods of economic analysis. It then reviews national income accounting concepts and the theory of income determination. In this section of the course attention is given to the operation of the monetary system, the problems arising out of economic fluctuations, and the problem of overall economic policy.

In the second part of the course the pricing of individual products and services is analysed and an outline of the theory of distribution is presented.

The examination will consist of one three-hour paper.

15.13 Economics II

Two hours per week including tutorial classes.

This course is concerned with micro-economics. It begins with an account of the theories of demand and production and then turns to an examination of pricing policies in different market situations. This section of the course will include a critical review of some of the empirical studies of pricing policy as well as the theoretical literature in the field. In its final section the course embraces the impact of government policy on the behaviour of the firm and the problems of the social control of industry.

The examination will consist of two three-hour papers.

15.14 Economics III

Two hours per week including tutorial classes.

This course is concerned with macro-economics. It begins with an account of the savings and investment analysis, the consumption function, and the multiplier including their dynamic aspects. On the basis of this foundation it then examines the problems of economic growth and economic fluctuations paying particular attention to inflation. The final section of the course is devoted to an examination of the problems connected with formulating and conducting economic policy.

The examination will comprise two three-hour papers.
15.15 Economics IV
Two hours per week

Part I: International Economics

The theory of international value. The balance of payments and the mechanism of adjustment. The determination of the composition and volume of world trade. International monetary problems and international commercial policies.

Part II: The Economics of Labour


The examination will comprise two three-hour papers.

15.21 Statistical Methods I

Two hours per week including tutorial classes.

The course is designed to provide students with the basic knowledge of statistical techniques as applied to economics and commerce. The course starts with a general discussion of methodological concepts, methods of collection and presentation of numerical information, and of sources of the Australian official and semi-official statistics. It proceeds then to the methods of summarized description of data by means of averages, measures of dispersion, and index numbers. Further topics deal with the analysis of time-series and of causal relationships between two variables. The course finishes with an introduction to the basic principles and methods of sampling.

The examination will consist of one three-hour paper.

15.22 Statistical Methods II

One hour per week.

This course is a direct continuation of the course in Statistical Methods I. It develops further the exposition of the sampling techniques and their application in the fields of market research, quality control and auditing. Other topics included in the course cover some more specific methods and applications of correlation and regression techniques and an introduction to demography.

The examination will consist of one three-hour paper.

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15.23 Advanced Economic Statistics I

The object of this course is to give a formal presentation of statistical theory. The theory will be presented at a sufficiently advanced level to serve as a sound basis for the subsequent study of its application to economic problems.

The examination will consist of one three-hour paper.

15.24 Advanced Economic Statistics II

The object of this course is to consider regression analysis from every angle—the least squares technique, the assumptions underlying its use, its application to economic data, the testing of numerical results and their economic interpretation.

Considerable attention is also given to recent work in econometrics.

The examination will consist of one three-hour paper.

15.31 Law A

Two hours per week

This subject will combine a treatment of legal history with an examination of the more important basic legal concepts. In particular it will include:

A general survey of the legal development from Anglo-Saxon times to the present day, taking into account political, social and economic factors. A history of the courts and other bodies administering the law. An examination of the principal sources of English law, viz.: custom, equity, professional opinion, judicial decisions and legislation. A survey of the law of procedure emphasising its importance in relation to the development of substantive law. An historical treatment of the main branches of the substantive law, viz.: crimes, torts, property, contract and equity. An examination of certain basic legal concepts, notably rights and duties, legal personality, property, ownership and possession. An examination of the nature and purpose of law.

15.32 Law B

Two hours per week

This subject will deal with the following matters:

A survey of the constitutional history of the United Kingdom. The general principles of the constitutional law of the United Kingdom. The constitutional history and law of New South Wales. The general principles of administrative law. In particular, this matter will cover delegated legislation and the use
and nature of the prerogative writs. The constitutional law of the Australian Commonwealth, including the nature of federal constitutions, the interpretation of the Commonwealth Constitution and a survey of the federal legislative executive and judicial powers. The survey of legislative power will concentrate on those powers important in the field of industrial law.

15.33 Law C
Two hours per week

This course covers:—

I. Criminal Law

The nature of crimes and criminal liability. A survey of criminal offences punishable under both Commonwealth and New South Wales law. The emphasis here will be on those offences which are most important in the field of industrial law.

II. Civil Law

(a) Torts—The nature of tortious liability. A survey of certain important representative torts.


(c) Property—The general principles of the law of real and personal property. Acquisition and transfer of rights in property. Rights over property in other persons.

Note.—In this subject attention will be drawn to the various sources of the substantive rules of Law, i.e., common law, equity and statute law.

15.34 Law D and 15.34 Law D, Parts I and II

15.34 Law D combines Parts I and II and consists of four hours lectures per week.

Part I: (Two hours per week)

This course is concerned with industrial law and pays particular attention to the Master and Servant Act, the Factories Act, and the law governing Workmen’s Compensation.

Part II: (Two hours per week)

This course is also concerned with industrial law and is complementary to Law D, Part I. It gives particular attention to the working of industrial conciliation and arbitration in both State and Commonwealth courts.
16.1 Theory of Management

The subject matter of this course provides an introduction to the methodology of organisation as the basic foundation of management and administration in all spheres. The functions of the administrator are approached in terms of their economic and social significance; the distinction between a technology and administration as a synthesis of the natural and social sciences is emphasised.

The course includes: a study of the activities comprising the management function; principles of planning, organisation and control and related techniques of investigation, forecasting, coordination direction and command; the basis and nature of authority and responsibility; problems of communication; conflicting value systems and criteria of efficiency as the basis of decision-making; the static analysis of organisation structures and the bases of departmentation; the dynamics of effective delegation, control, leadership and executive development.

Throughout the course students carry out assigned tasks in the re-statement and application of basic theory and principles in terms of hospital administration itself. The course aims to help the student develop an individual philosophy of management as the basis of fulfilling his responsibilities as a hospital administrator.

16.2 Hospital Planning, Construction and Design

The following topics will be treated: The administrator's relationship to the architect, building regulations, documentation and drawings. The site, environment and planning of the hospital. Types and methods of construction of hospitals. A detailed consideration of the component parts of the hospital from a planning, design and construction point of view. Ward units, food services, boiler house, laundry, operating theatres and special hospital units.

16.3 Fundamentals of Medical Science

This subject will be for non-medical graduates. There will be a series of lectures covering elementary aspects of anatomy and physiology. The component units of the human body will be considered and the treatment will include the bony skeleton, the blood, the respiratory system, the digestive system, the muscular and nervous system, excretory organs, reproductive organs and endocrine glands.
A series of lectures on the fundamental principles of pathology and microbiology will be given covering the various component units of the human body.

The medical terminology as used from day to day in medical records will be dealt with, with emphasis on the diagnostic tests and therapeutic measures in use within the hospital.

The commonly used clinical equipment — surgical equipment, X-ray, pathology and physiotherapy apparatus, will be demonstrated.

16.4 Fundamentals of the Hospital in Operation

An intensive orientation to the techniques of operation of all types of the modern hospital. Emphasis is placed on the critical study of hospital facilities, planning and equipment. A study of special hospitals and various health units will also be included.

Department heads of hospitals will serve as guest lecturers and discussion leaders.

Field trips will be made to each clinic or department.

The syllabus will include: the history of hospitals, the function of hospitals, the governing board, the hospital administrator, hospital organisation and management, medical staff organisation and medical education, nursing service and nursing education, special services and departments (operating room, obstetrical service, anaesthesiology and recovery room, central sterile supply, casualty and emergency department, blood bank, diagnostic radiology, therapeutic, radiology, laboratory and pathological services, department of physical medicine and rehabilitation service, the clinical services). Out-patients' department, pharmacy department, medical records, medical social service, the almoner's department, admission and discharge, purchasing and stores control, food production, catering and dietary services, housekeeping, laundry and linen control. Engineering service-plant maintenance. The accounts department and financial control, the personnel department, legal aspects of hospital affairs.

16.5 Theory of Management

This course will be similar to 16.1, but the emphasis will be transferred from the development of a philosophy of management to the translation of principles and policies into action through techniques of communication. Conference techniques, methods of instruction, work study and job relations will be given more detailed treatment.
16.6 Hospital Organisation

This subject will deal with the following topics:—

(a) The external forces operating and influencing the chief executive officer. The influence of various political systems and pressure groups at work.

(b) The internal forces at work and influencing the chief executive officer. The legislative, executive, judicial and trusteeship function of the hospital board. The central or governmental control.

(c) The formal organisation of the hospital. The line of authority and the problems associated with formal organisation of the component hospital departments, clinics and staff.

(d) The functions of the chief executive officer. Designing the organisation in terms of the specific needs of the hospitals. Initiating and formulating basic policies for board approval and determination; the general policies and their promulgation.

In the latter portion of the subject, the hospital board members and chief executive officers of large, medium and small hospitals will be invited to discuss the organisation and management within their respective hospitals.

A series of case studies dealing with the organisation and management structure of selected hospitals will be analysed and critically appraised.

16.7 Advanced Hospital Administration

Hospital accounting, statistics, law and public relations are studied in lecture and discussion groups. Emphasis will be placed on the interpretation and utilization of the subject matter. Current hospital topics, their origin, development and contemporary and future status, will form part of the discussions.

16.8 Biostatistics

The lectures in this course consider the collection, tabulation and elementary analysis of vital statistics, including the treatment of rates, distribution of variates and sampling variation.

16.9 Public Health Administration

This subject will deal with the role of the hospital in the field of Public Health and will include the following topics: communicable diseases, geriatrics and chronic diseases, mental hygiene, physical rehabilitation, rural hospitals and regional planning, special hospitals and health centres.

Medical care administration will deal with health insurance schemes, both governmental and voluntary methods, and the social implications of health facilities and resources.
BIOLOGICAL SCIENCES
Subjects 17.00 to 17.71 and Science Subjects

17.11 BIOCHEMISTRY

An introduction to the chemistry and physical properties of carbohydrates, lipids, amino-acids, proteins and other compounds of biological importance.

Practical work to illustrate the lecture course.

17.12 BIOCHEMISTRY

An introduction to the following topics:—

The chemical and physical properties of proteins.

The nature of enzymes and their mode of action. The classification of enzymes and coenzymes, and the more important enzymic systems.

An introduction to the principal metabolic pathways involving carbohydrates, lipids and proteins. The hormonal control of metabolism. Comparative aspects of nitrogen metabolism.

Practical work to illustrate the lecture course.

17.13 BIOCHEMISTRY

An introduction to the following topics:—

Carbohydrates, proteins, lipids. Their chemical and physical properties, structure, classification and biological significance.

The general properties of enzymes and the nature of the catalytic processes. Classification of enzymes and coenzymes, and illustration of the more important enzyme systems.

The main reaction sequences involved in the metabolism of carbohydrates, lipids and proteins. The hormonal control of metabolism.

An introduction to comparative biochemistry.

Practical work to illustrate the lecture course.

17.14 BIOCHEMISTRY

A study of the following topics:—

(1) The fine structure of cells. The intra-cellular location of enzymes and enzyme systems. The extraction and purification of enzymes and co-factors.

(2) The structure and properties of proteins. Nucleic acids, nucleoproteins, protein synthesis.
(3) The biochemistry of the cell wall and of reserve materials. Alternative patterns of carbohydrate metabolism.

(4) Biological oxidations. The production, storage, transport and utilization of energy in biological systems.


Practical work to illustrate the lecture course.

17.21 General Biology


Practical work to illustrate the lecture course.

At least two obligatory field excursions are held during the year.

17.22 Biology

A continuation of 17.21 General Biology, in the fields of Angiosperm systematics, anatomy and physiology, with special reference to plants of economic significance.

Insects of domestic and economic importance. Functional aspects of vertebrate anatomy and histology. Mammalian evolution.

Practical work to illustrate the lecture course.

Obligatory field excursions.

17.23 Experimental Biology

The experimental investigation of the physiological functions of plants and animals, including a short course in experimental embryology.

17.30 Industrial Botany

A short course for students in Food Technology.

The essential structure and function of higher plants are studied, with special reference to plants which are used for food.

Practical work to illustrate the lecture course.
17.31 Botany

Identical with Botany I Part I (Science)

Variations in the morphology and anatomy of the Angiosperms, economic botany, and a brief introduction to Angiosperm systematics.

Practical work with examples from the local flora to illustrate the lecture course.

Obligatory field excursions.

17.40 Industrial Entomology

A short course for students in Food Technology.

Includes a brief outline of the structure and classification of insects as an introduction; the general principles of economic entomology; details of insect pest species, their biology and control; insecticides.

Practical work to illustrate the lecture course.

17.41 Entomology

A basic introduction to the Class Insecta. Classification and systematics; anatomy and morphology, behaviour, social development and ecology of insects.

Practical work to illustrate the lecture course.

Obligatory field excursions.

17.42 Entomology

The principles of economic entomology. Details of insect pest species, their structure, classification and life histories. Direct and indirect control measures. Insecticides, fillers, spreaders, solvents and synergists.

Practical work to illustrate the lecture course.

Obligatory field excursions.

17.43 Entomology

Insect physiology. Digestion and the alimentary canal. Sensory receptors and the nervous system. The circulatory and respiratory systems. Hormones, moulting, diapause, temperature and water relations.

Practical work to illustrate the lecture course.
Part A: General Microbiology

Historical outline—Morphology and cytology of bacteria.
Cultural methods—Sterilization of equipment and media. Effect of physical and chemical agents on micro-organisms.
Isolation and identification of bacteria. Introduction to moulds and yeasts.
Outline of dairy bacteriology.

Part B: Medical Bacteriology

A study of the bacteria causing diseases in man.
Practical work to illustrate the lecture course.

17.52 Microbiology.

Growth and multiplication of bacteria.
Biochemical activities of bacteria.
Bacteriophage—its nature and mode of action.
Antigen—antibody reactions; the fundamental principles of serology.
Microbial variation.
Disinfection, disinfectants and inhibitory agents.
Food microbiology.
Industrial microbiology.
Practical work to illustrate the lecture course.

17.53 Microbiology

Classification—General principles involved in classification. The major groups, including identification.
Techniques—Media preparation, handling and use. Isolation and maintenance of stock cultures. General techniques and precautions.
Morphology and Life Histories—A study of selected examples from the major groups, usually choosing those of economic importance.
Spoilage—General considerations.
Genetics—An outline of fungal genetics.
Practical work to illustrate the lecture course.
17.71 Zoology

Identical with Zoology I, Part I (Science)

The comparative anatomy, physiology and systematics of the major Invertebrate phyla.

Practical work to illustrate the lecture course.

At least two obligatory field excursions will be held during the year.

Honours in Biochemistry, Entomology, or Microbiology.

(Appplied Biology Course)

The programme of work includes both advanced formal study and a research project. A thesis is to be submitted embodying the results of this research project. The details of the programme are variable and will be drawn up in each individual case by the Professor or the Lecturer in charge of the subject.

Science Course Subjects

Biochemistry I (Science)

The following topics are dealt with in this course:—

Part I

An introduction to the study of the physico-chemical properties of systems. The chemical properties of amino acids, peptides and proteins, carbohydrates, fatty acids, sterols and porphyrins, and the biological roles of these compounds. The nature of enzymes and their mode of action.

Part II

An introduction to the more important enzymic systems. The intermediary metabolism of carbohydrates, lipids and proteins. Practical work to illustrate the lecture course.

Biochemistry II (Science)

A study of the following topics:—

Part I

1. The fine structure of cells; the intracellular location of enzymes and enzyme systems; the extraction and purification of enzymes and co-factors.
2. The biochemistry of the cell-wall and of reserve materials.
3. An introduction to comparative biochemistry.
4. The biochemistry of micro-organisms.
Part II

5. Nucleic acids, nucleoproteins, virus multiplication, protein, synthesis, and general biochemistry of reproduction, growth and development. Immunological phenomena.

6. Biological oxidations; the production, storage, transport and utilisation of energy in biological systems.


Practical work to illustrate the lecture course.

Botany I (Science)

Part I

Identical with 17.31 Botany.

Part II

Plant ecology: Lectures and field work dealing with the nature, measurement and inter-relationships of vegetation, soils and climate.

Plant physiology: Physiological studies of the whole plant.

Practical work to illustrate the course.

Botany II (Science)

Part I

Plant evolution and a study of the major plant groups, including Angiosperm systematics.

Part II

Plant pathology.

Cytology.

Genetics.

Plant physiology.

Practical work to illustrate the lecture course.

Obligatory field excursions.

Microbiology I (Science)

Part I

(a) See 17.51 Microbiology.

(b) See 17.53 Microbiology.

Part II

(c) See 17.52 Microbiology.

(d) A study of the principles of microbial physiology. An introduction to protozoology and algology.

Practical work to illustrate the lecture course.
ZOOLOGY I (SCIENCE)

Part I

Identical with 17.71 Zoology.

Part II


ZOOLOGY II (SCIENCE)

Part I

The comparative anatomy and histology of the Chordata. Practical work to illustrate the lecture course. Obligatory field excursions.

Part II


An introduction to palaeontology.

Genetics, cytology, evolution.

Practical work to illustrate the lecture course.

HONOURS IN BIOCHEMISTRY, BOTANY, MICROBIOLOGY OR ZOOLOGY (SCIENCE COURSE)

The honours course in biochemistry, botany, microbiology or zoology includes advanced formal study in approved subjects, together with a research project. The results of the latter are embodied in a thesis.

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18.12 **Industrial Administration**

An examination of the principles and practices used in the development of an organisation so that it can attain an industrial objective. The completion of the organisation with job specifications. The use of operation instructions.

An analysis of the principal functions of general management, production engineering, sales, finance and personnel, followed by that of the subsidiary functions, their location in the organisation and the use of common industrial techniques in their performance.

- Plant location.
- Building design.
- Equipment selection and design.
- Product design.
- Layout.
- Materials handling.
- Production planning and control.
- Stores and inventory control.

Costing and accounts.
- Purchasing.
- Quality control.
- Maintenance.
- Salvage.
- Methods.
- Marketing.
- Development.
- Personnel.

Problem cases relating to the subsidiary functions analysed and solved.

18.23 **Production Control**

The purchase, storage, routing, scheduling and shipping of materials.

A study of the batch system of production, the long-run batch system and line production.

Automation and control.

Co-ordination of production control and costing as an aid to company policy.

18.33 **Methods Engineering**

The systematic application of methods engineering to manufacturing operations:

(a) The organisation of physical facilities in preparation for manufacturing.
- Plant location.
- Equipment selection and housing.
- Layout preparation for economic handling of materials.
- The use of process flow charts and diagrams.
(b) Work simplification.
Detailed analysis of operations. Estimation of probable savings from work simplification and determination of the type of study to be applied.
The use of operation-process charts, analysis sheets, man-machine operation charts.
Time and motion study. The determination of standard methods and standard times. Time formulae.
Synthetic methods of assessing operation times.
Levelling and allowances.

(c) Incentive principles and practices.
The economic effect of incentives.

18.44 PERSONNEL ADMINISTRATION

Location of the function in the organisation and definition of its scope. The relationship to general management, manufacturing and the industrial office.
The development and testing of a personnel policy.

(a) Personnel employment.
Planning personnel requirements. Interviewing, testing, selection, placement and follow-up of employees.

(b) Employee services.

(c) Industrial training.
Training programmes, cadetships and apprenticeships.

(d) Safety engineering.
Laws, regulations and requirements.
Insurance and compensation. Accident analysis.

(e) Wage administration.

(f) Union aims and relationship.

(g) The union point of view. Six one-hour lectures by a union official.

18.53 DESIGN FOR PRODUCTION I (MATERIALS AND PROCESSES)

Consideration of ultimate economy in application to industrial design. An examination of the method of arriving at a satisfactory design for quantity production.
A critical analysis of the properties of industrial materials and the characteristics resulting from the use of forming, casting, shaping, conditioning and surfacing operations applied to these materials.

Preparation of industrial designs and analysis of manufactured products from the design aspect.

Theory

Historical—Growth of mass production, influence of World Wars.
Classification of manufactured products.
Sales considerations.
Economic consideration.
Product and process development.

Materials and Processes

Materials—Broad consideration in selecting materials.
Processes—Casting and moulding processes; hot working of metal; cold working of metal; metal removal.
Joining processes.
Finishes and finishing.
Assembly process.
Demonstrations—College workshops; foundry, welding, forge and heat treatment, toolroom, press shop.
Laboratory—Model making, product evaluation, metal cutting.
Design—Case studies: design of product and associated tooling, consideration of quantity and cost.

18.54 Design for Production II (Interchangeable Manufacture)

Theory

The economics of interchangeable manufacture: manufacturing, assembly and servicing costs, advantages and disadvantages of pursuing interchangeable principle.

The function of the prototype and development and uses of the production model.

The use of standards: factors to be considered when using national basic standards.

Tolerancing and the determination of accumulated tolerances: probability theory and its application.

Design for interchangeable or unit assembly: design, dimensioning and tolerancing to fulfil functioning and manufacturing and inspection requirements.
Gauges and gauge wear: gauging principles, effect of gauge tolerance and wear, gauge design.

Design of jigs, fixtures and tools.

Functional, manufacturing and inspection requirements: methods of inspection, process inspection, finished parts inspection, quality control and sampling inspection.

Preparation of component drawings and operation drawings.

Metrology: basic principles of precision measurement, metrological practice in measurement, principles of construction, care and use of measuring equipment.

**Drawing Office**

Analysis of a design to fulfil functioning requirements, preparation of component drawings, preparation of operation drawings, design of associated gauges, tools and fixtures.

**Laboratory**

Metrology: assignments associated with gauging and tooling.

Surface finish, inspection: non-destructive testing, quality control and sampling inspection.

**18.64 Industrial and Commercial Law**

(a) The elements of Mercantile Law as applied to industrial contracts and agreements. The elements of Bankruptcy Law and Company Law.

(b) Industrial Law.


Piece, casual and junior work.

Wage rates, loadings and penalties.

Compensation.

Management of industrial disputes.

Arbitration and conciliation.

(c) Employers' associations, their functions and method of operation.

(d) Industrial regulations relating to Lifts and Scaffolds Acts, Factories and Shops Act.

(e) The elements of Patent Law and regulations relating to trade marks and registration of designs.

(f) The writing of specifications.
Problems Relating to the Product

Product policy. Level and range of quality and product properties. Price level determination.

Sales Analysis


Sales Promotion

Types of advertising. Characteristics of media and media selection.

Sales Management

Channels of distribution. Centralisation or decentralisation. Preparation for service to the product.

Management of the selling organisation.

Characteristics of sales personnel.

Systems of remuneration.

Selling aids. Training and appraisal.

Public Relations
TRAFFIC ENGINEERING

Subjects 19.00 to 19.51

19.01 APPLICATIONS AND PRACTICE OF TRAFFIC ENGINEERING

This course covers the various aspects of the professional practice of traffic engineering and includes detailed studies of:

(a) The design and execution of traffic surveys—volume and speed studies, delay in congestion, origin and destination, parking and travel pattern surveys.

(b) Kinematic design of highways—capacity, lanes, medians, shoulders, design volume.

(c) Intersection design and control—space and time systems: channelization, roundabouts, grade separation, signals, vehicle actuated, fixed time, co-ordinated systems, cycle times, delays.

(d) Traffic control devices and regulations—signs, markings, one-way streets, unbalanced flow, speed limits and zoning, pedestrian control.

(e) Street lighting—methods of discernment, characteristics of lighting systems, location and spacing.

(f) Organization of traffic engineering functions.

19.011 TRAFFIC ENGINEERING

(A course for students in Highway Engineering)

Measurement of traffic characteristic volume, speed travel and delay times, origin and destination surveys, parking studies, accident characteristics.

Highway and intersection capacity, two-lane and multilane highway, urban thoroughfares—effect of parking, tram tracks, public transport vehicles, properties of intersections, capacity of freeways and expressways.


Traffic estimation and prediction—land use generation, parking generators, rational models for allocation of traffic, traffic growth, critical hour.

19.11 Theory of Traffic Behaviour

The object of this series of lectures is to study the basic characteristics of the main elements entering into a traffic situation and then develop the properties of a moving stream of traffic under the varying conditions prevailing in practice. The characteristics cover the human operator (driver and pedestrian), the motor vehicle, the highway and street system and the environmental context, and include reaction time, physiological and psychological factors, vehicle dimensions, power/weight ratio, braking and steering characteristics, highway and intersection capacity. The properties of the traffic stream are developed in terms of continuous and statistical models—uniform capacity curves, shock wave analogues, random time series and queuing systems. The series also includes discussions on the mathematical basis for the employment and design of traffic control devices such as pedestrian crossings, turn pockets, parking regulations and various others.

19.21 Statistics for Traffic Engineers

A descriptive introduction to statistical ideas and methods, with emphasis on practical applications in traffic planning and control.

Fundamental statistical ideas (randomness, sample and population, etc.). The handling of data, statistical description.


Sampling techniques. Design and analysis of experiments.

19.31 Operational Analysis of Traffic Systems

These lectures describe the methodology of operations research and systems analysis and include discussion on the specification and measurement of operational parameters and performance indices, design of trials, sensitivity analysis and linear programming techniques. The main topics covered are:

(a) Generation of traffic, estimation of traffic growth and assignment of traffic to components of a highway system and competing travel modes.

(b) Economic analysis of highway improvements and applications to highway finance and the quantitative determination of priorities for planning construction programmes.

(c) Highway needs studies; inventories and sufficiency ratings.

(d) Transport planning, relative efficiency of different travel modes, “degrees of freedom” of travel modes; operational relationship between transport and town planning.
19.41 Data Reduction and Traffic Simulation

The main object of these lectures is to introduce the student to the use of mechanical computing methods both for standard traffic computation and for research. Numerical computing methods include: description and use of automatic computing machines (analogue and digital); elements of programming; types of large-scale traffic computations; time-distance curves; analysis of volume studies; reduction of origin and destination and travel pattern surveys; analysis of accident records and needs studies; calculation of road user costs. Use of computers for traffic research—simulation of the traffic stream; random time series; Poisson models; representation of "real" traffic; intersection models; queuing systems.

19.51 Traffic Law and Enforcement

These lectures are intended to explain the framework in which the private citizen, as an operator of a motor vehicle, must orientate his behaviour in order to permit the effective operation of a highway traffic system. The topics covered are:—

Consideration of motor traffic acts, regulations and penalties. Variations from State to State. Motor vehicle standards. Uniform traffic code. Traffic Court functions, procedure and practice; expert evidence from traffic technologists; medical evidence; legal status of alcohol tests. Principles of law enforcement in relation to traffic operations—functions and organization of the police, special accident squads, selective enforcement, education of violators, courtesy lectures, corrective centres, police regulatory functions and powers, including parking. Vehicle inspection methods. Functions of other bodies concerned with safe and efficient traffic operations, such as automobile clubs and associations, road safety councils. Driver training and licensing requirements. Driver and pedestrian education.
HIGHWAY ENGINEERING
Subjects 20.00 to 20.41

20.01 ROAD LOCATION AND DESIGN


20.011 ROAD LOCATION AND DESIGN

(A course for students in Traffic Engineering)


20.11 PAVEMENT DESIGN AND SOIL ANALYSIS

Empirical methods of pavement design employing soil classification tests.

Empirical method of pavement design employing soil strength tests.

Methods of pavement design employing soil classification and soil strength tests.

Partly empirical and partly theoretical methods of pavement design.

20.21 ROAD CONSTRUCTION


Road construction plant operation, characteristics, duties, economics, blasting, quarrying, etc.


20.31 BRIDGE DESIGN


20.41 HIGHWAY LAW AND CONTRACT DOCUMENTS

Highway law. Contract documents, agreement, bond specifications, quantities.
INDUSTRIAL ARTS
Subjects 21.00 to 21.34

21.01 Industrial Education I

(Three hours per week, 1st and 2nd Terms)
A general consideration of the areas of industrial education; an introduction to the crafts of basic fitting and woodworking theory and practice.

21.02 Industrial Education II

Six hours per week 1st, 2nd and 3rd terms—of which 3 hours will be devoted to working in wood and 3 hours in metal. Two hours theory and four hours practical.
(2) Wood Craft. Theory design and practice in cabinetwork.

21.03 Industrial Education III

Six hours per week 1st, 2nd and 3rd terms, of which 4 hours will be devoted to advanced craft work in wood and metal, and two hours will be devoted to fine arts.

1. Wood and Metal Craft
   The use of machine tools with wood—wood machinery and wood turning. Wood finishing. The techniques of heat treatment of metals in craft work.

2. Fine Arts
   An introduction to bookcrafts including printing and leatherwork, weaving and pottery. Opportunity will be given for students to develop some skill in these fields.

21.12 Education I

(Two hours per week, 1st, 2nd, 3rd Terms)

History of Education

This course, offered in the second year, will serve both a general purpose as history, and a professional purpose as leading the student through the major educational ideas and developments from ancient times to the present. So, in its contribution to the general strand, it will emphasise the fact that the whole story of human life might be regarded as a number of interacting histories of which the history of education forms no inconsiderable part, and ranks alongside the histories of politics, art, music, science, etc. In its contri-
bution to the professional strand the course provides the background to both comparative education and theory of education which follow in later years, and it also puts into perspective current fashions in method.

The content of the course traverses the educational contribution of the great pioneers of education from the earliest times, emphasising their impact on their own and on later generations; and it also covers the recognised period of development of educational theory and practice from ancient times to the present. A brief naming of topics will indicate the range of studies contemplated, each to be treated in a manner consistent with stated aims of the course: Education in the Greek and Roman periods; Mediaeval education—church schools, development of secondary education, the founding of universities; transition to modern times—the revival and influence of classical learning; the schools of the Renaissance and Reformation and of the counter-Reformation; the work of the more prominent educational thinkers in the period seventeenth century to nineteenth century; a strand on the history of education in Australia and its relationship to educational developments and ideas in other countries.

Special attention will be given to tracing the development of the ideas of a liberal education and also of technical education throughout the centuries as these have special relevance for the students of the course in Industrial Arts.

**21.13 EDUCATION II**

(Three hours per week for 1st, 2nd and 3rd Terms)

*General Method I*

One hour per week for three terms.

This course will be integrated with the course in Psychology so that topics appropriate to education are given the necessary educational bias.

It will also be closely woven with and reflect the point of view discussed in the theory of education. The topics usually considered under general method are—the problems of method, the basis of classroom practice, the class unit (classification of pupils, individual differences, social development, discipline, etc.) the motivation of learning, methods of teaching and learning for a variety of types of lessons, audio-visual education, preparation of lesson programmes, units of work, etc., evaluation (achievement, general ability and aptitudes) and methods of assessing other qualities, diagnosis of difficulties and remedial procedures.
General method is also linked with the practical work, especially with the demonstration lessons, and with the special method subjects. The latter should be taught to conform to the general principles enumerated in the general method course.

*Special Methods I*

Two hours per week for three terms.

This course will treat the special educational methods involved in teaching industrial arts subjects. It will be given in third and fourth year, one course following directly upon the other. Special Methods I will be introductory and deal with general principles.

21.14 *Education III*

(Ten hours per week in 1st and 2nd terms and 9 hours per week in 3rd term)

*Theory of Education*

Three hours weekly for three terms.

A theory of education is basic to educational practice whether or not the practitioner is especially conscious of it. Hence, provision is made for the students who intend to enter the teaching profession to be made aware of the educational theories that contend for support and influence in contemporary education, and to examine them critically. Some of these theories will have been treated in their historical setting and development in the course on history of education, but an examination of their current impact comes within the scope of a theory (or philosophy) of education. The course in the theory of education is designed then to examine contemporary educational theories, to examine contemporary theories of the curriculum, especially in their relationship to school and to tertiary education, and to bring into focus the basic issues in current education throughout the world, but especially in New South Wales and Australia. Necessarily it will include some topics such as the nature and aims of education, the function of the school in society, the educational significance of current knowledge about the nature of the learner, and the role of the teacher.

*Comparative Education*

Two hours weekly for three terms.

The course will provide a comparative study of the educational systems of several countries—generally England, the United States of America, the Soviet Union, one European country—especially in relation to the educational systems in Australian States. It will include the study of educational development in countries
which have newly won their independence—South-East Asian countries generally—and the study of educational development in colonies which have not yet won their independence.

The topics dealt with for the several countries will include the growth of the national systems of education, the historical and social background relevant to the study of each educational system, administration and organisation, special educational problems—e.g. the relationship between Church and State in education, tertiary education, teacher training, technical education, secondary education, etc.

Finally, there will be a critical and comparative evaluation of Australian educational ideas and practices seen against the current world background.

**Professional Ethics**

One hour weekly for two terms.

A general outline of the ethics involved in teaching.

The accepted relationship with other members of the profession—parents and pupils—will be examined and such issues as professional responsibility discussed.

**General Methods II**

One hour weekly for three terms.

See general outline given under General Methods I.

**Special Methods II**

Three hours weekly for three terms.

An advanced course in the methods of teaching industrial arts subjects. The subject matter will require a sound knowledge of the theory and techniques already taught in the technical and professional strands.

**21.23 Wood Technology**

(Two hours per week for three terms, one hour theory and one hour laboratory)


**21.34 Drawing and Design**

(Three hours weekly for two terms)

Advanced problems in engineering or architectural drawing and design. Assignments to be carried out in the studio, but tutorials will be given where necessary.
HUMANITIES AND SOCIAL SCIENCES
G1 to G95 and Geography (Science) Subjects

G10 ENGLISH

(A course of 48 lectures on language and literature)

The language part of the course is an introduction to the nature and uses of language. Its aim is to develop: (1) an understanding of the purposes for which language is used, the ways in which language operates, and the criteria by which it may be judged; and (2) some skill in the analytical and critical reading of different kinds of writing.

The literature part of the course is a survey of man and his world as seen in contemporary literature. This course is built around a number of selected texts in fiction and drama by British, American and Australian writers. The aim of the course is to provide a general introduction to 20th century literature through an account of the literary background of the period and by a study of its main themes and forms.

G12 ENGLISH

This is a course of forty-eight lectures on modern literature, English, American and Australian. It contains a core of works for compulsory detailed study and some additional literature for more rapid and selective reading. The texts are chosen for their individual merit and their representative character.

The aim of the course is to indicate the variety and the main concerns of modern literature, to encourage critical appreciative reading, and to consider the principles of literary criticism.

The course includes discussions, play-readings and recordings as well as lectures. The drama is studied with reference, whenever possible, to current films and stage productions.

G13 ENGLISH

This is a course of 68 lectures on English literature. The texts chosen for study will be used to illustrate the development of English drama, fiction and poetry and as well to raise general questions of literary structure and appraisal.

G14.1 ENGLISH LANGUAGE

(An elective for Commerce students)

The course is of sixty-eight hours, and is open to students whether they have previously completed English G18 or not. It is not a
course of lectures, but rather a series of "workshop" investigations into the structure and operations of language, and of English in particular.

The materials to be examined are individual acts of speaking, listening, writing and reading. Students will make their own contributions to the body of material studied from their own speech and from their observations of language in books, in newspapers, in broadcasts, and in the varieties of occupations and interests with which they are familiar. The use of tape-recorders will facilitate observation of speech habits.

Interest will be centred in the following aspects:
1. The speech community.
2. The functions of language.
3. Social and regional differences in speech and writing.
4. The structural devices of language.
5. Meaning.
6. Vocabulary, and its adaptation to changing needs.
7. Language planning.

G14.2 ENGLISH LITERATURE
(An elective for Commerce students)

This course of sixty-eight lectures contains a core of works for compulsory detailed study and some additional literature for more rapid and selective reading. The texts are drawn from the literature of different ages and countries, and are chosen both for their individual merit and their representative character. The course deals primarily with the three modes of comedy, tragedy and satire. Some attention will also be paid to poetry and its distinctive features.

The emphasis will be on the assessment of literary purpose and the evaluation of literary worth rather than on the historical development of the various literary forms. The course will include discussions and recordings as well as lectures, and plays will be studied, wherever possible, with reference to current film and stage productions.

G20 HISTORY

This course consists of forty-eight lectures: thirty-six devoted to an outline of the development of Western civilization and twelve devoted to an introduction to Australian History. The course is so designed as to give students who decide to take History as their Advanced Elective in later years necessary background to enable them to gain the maximum benefit from their second course.

Western Civilization—This part of the course is a general survey of the development of human society from the time of the Renaissance to the present day. The treatment of so vast a subject must necessarily be highly selective. The lectures will describe only those developments
and personalities which have given to Western civilization its specific character and whose influence upon the outlook and conditions of Western society remains significant at the present time.

The importance of art and literature, and especially of thought and ideas will be stressed. The course will emphasize the relevance of this study to the modern world. By providing students with standards of comparison with societies, ways of life and thought different from their own, it is hoped to develop in them a perspective and a critical approach to present-day problems.

*Australian History*—This part presents in brief outline the economic, social and political development of the modern Australian Commonwealth from *(a)* the British background to the settlement of New South Wales, to *(b)* the Second World War.

**G22 History**

Students who elect to take this subject may have the choice of the following courses. In all cases there are forty-eight lectures which will reflect the special interests of the lecturers concerned and have been designed to follow on the introductory work given in G20.

(i) *Australian History*

This course is designed to survey the more important aspects of Australian history up to the present day. It will avoid an insular approach, and will discuss Australian history in its broader setting of British and World history, with constant references to the British background and to the stories of Canada, New Zealand and South Africa. The preliminary part of the course deals with the opening up of the Pacific and with the maritime explorers. Then follows an analysis of the 18th century background to make more apparent the reasons for the decision to establish a penal settlement in eastern Australia in 1788. Subsequent lectures trace the gradual evolution from penal to free settlements. Explorers open up the continent and the pastoral industry expands and flourishes; immigration from the United Kingdom is encouraged; and the foundations of an urban society laid; and the cessation of transportation to eastern Australia heralds the advent of representative and responsible government to the several colonies. All these developments (1815-1850) are related to the English background of the Industrial Revolution, industrial unrest and post-war political and social discontent culminating in Chartism. At the same time, progress in Australia is compared and contrasted with developments in Canada, New Zealand and South Africa, with their problems of national and racial contacts. After a survey of the colonies of settlement and of British colonial policy in general, the story returns to Australia, where the discovery of gold in New South Wales and Victoria in 1851, with its accompanying flood of immigrants, confronts the colonies with recognisably
modern problems. There is a moderately successful agitation for political democracy against the interests of the squatters “to unlock the land”. Immigration stimulates secondary industry and Australia’s “Industrial Revolution”, trade unionism and the rise of the Labor Party. The 1890s are a decade of crisis, involving the country in a disastrous depression and in a series of strikes and lock-outs. In the political sphere, Federation is achieved at the end of the century. In the last fifty years Australia’s domestic history has not been without incident—e.g., the principle of the Basic Wage, the political conflict between labour and non-labour, and the depression of the 1930’s—but events have forced the nation to define more exactly its attitude to European and Pacific affairs and to relations with Britain and other members of the British Commonwealth. Participation in two world wars and in the League of Nations and the United Nations demonstrates Australia’s growing realisation of her duties as a member of the community of nations.

(ii) Diplomatic Background to the Second World War

This course will contain an examination of world history, especially European and American, between 1919 and 1939. In particular, attention will be paid to the rise of the Communist, Fascist and Nationalist Socialist forces within Europe, and their expansion beyond. This inquiry will form the basis of an analysis of the events leading to the Second World War, which forms the central theme of the course; but also involved is an investigation of American-Japanese relations and other allied matters.

(iii) Soviet Russia

A brief account of the history of Soviet Russia from the collapse of the Tsarist regime until the recent past. The chief interest of this course will centre around internal political developments beginning with the Bolshevik Revolution, though attention will be paid to questions such as Soviet ideology, economic growth, and foreign policy.

(iv) Modern European History

This course will study the political, social and economic development of Europe in the nineteenth and twentieth centuries. The French Revolution was the first concerted attack on the “old order” and gave a great impetus to the movements of liberalism, nationalism, and socialism which have been so important in recent history. The progress of these ideas and forces will be studied in detail in certain countries, e.g., England, France, Germany and Russia. And greater point is given to political change by a consideration of the profound social and economic implications of the Agrarian and Industrial Revolutions.
Lastly, “power politics”, imperialism and the two World Wars are seen as results of the main trends in the nineteenth century.

(v) British History, Tudor and Stuart Periods

A course of forty-eight lectures covering primarily the years from 1485 to 1689, with special regard to the period from 1603 to 1660. The course begins with a brief background examination of economic political, religious and other developments during the Tudor period (e.g. the emergence and establishment of the “Tudor despotism”; the government of Tudor England; the agrarian revolution; Tudor economic policies; the Reformation movement.) More detailed attention is then given to developments during the years from 1603 to 1660 (e.g. James I and the “Divine Right of Kings”; the increasing self-assertion of Parliament; conflicts between Crown and Parliament on constitutional, economic and religious matters; Puritanism; the “11 years’ Tyranny of Charles I”; the outbreak and development of the Civil War; the Commonwealth; Cromwell’s attempts to find a solution to the constitutional problem; the restoration of the monarchy). A survey is then made of some of the more important aspects of the period 1660-1688, and the course concludes with an examination of the “Glorious Revolution”, its nature and consequences.

G23 History

Australian History

A course of sixty-eight lectures based on the course outlined under G22 (i), but assuming no introductory knowledge and extending the sections of the course devoted to the British Commonwealth.

G24 History

This course is offered to first year students, both full-time and part-time, in the Faculty of Commerce. It consists of sixty-eight lectures on the history of Great Britain from 1760 to the present day. Attention is also given to the history of the British Empire and Commonwealth in the same period.

The course tries to present a picture of the changing life in Britain since the period when the Industrial Revolution began to break up the traditional structure of British society. The important political and economic developments will be dealt with but the main emphasis will be upon the life, work and thought of the British people. Topics such as religion, education, literary and intellectual developments, working class movements will receive as much attention as the more conventional subjects of political conflict and reform, economic change and the growth of social welfare and State intervention.
Students will be encouraged to read as widely as possible in this field and ample provision will be made for them to concentrate on topics that they may find to be of special interest.

G25 HISTORY  
(An elective for Commerce students)  

This is a course of sixty-eight lectures on the history of the United States of America from the time of the Declaration of Independence to the present day.

It is designed to serve as a parallel to the course on modern British and colonial history offered to first year students in the Faculty of Commerce. It will not require, however, any previous knowledge of history, and students who have not taken the British history course will not find themselves at any disadvantage.

The United States of America affords the best example of the development of a modern Great Power. Indeed, it is hardly possible to understand international affairs at the present time, both diplomatic and economic, without constant reference to the recent history of the U.S.A.

This course will begin with a brief survey of the main elements that went to form American society before the Civil War—the Constitution, the drive to the West, the Frontier and its effect on democracy, the growth of sectional interests. Then will follow the central part of the course—the emergence of modern America. Attention will be focused on such topics as the rise of Big Business and the cult of individualism, the tension between East, West and South, the origin and progress of organised Labour, the effects of the trade cycle, the influence of the World Wars, the nature and significance of the New Deal and the concurrent decline in laissez faire ideas, the composition of the two major political parties, and the present problems and future prospects of the American community. The third section of the course will deal with the relations between America and the outside world. Here the main themes will be the conflict of isolationism and international co-operation and the growth of America’s responsibilities as a world leader. Wherever possible, parallels will be drawn between historical developments in the U.S.A. and Russia and a careful study will be made of the relations between these two countries since 1945.

Students will be encouraged to read as widely as possible and to concentrate on those aspects of the course that they find most interesting and instructive.

G26 HISTORY  
(A course for students in Applied Psychology)  

A course in Australian history based on G23 above.

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G30 PHILOSOPHY

A course of forty-eight hours, intended as an introduction to logic and scientific method. The topics to be treated include:

- The formal features and relationships of propositions;
- Immediate and mediate inference;
- Informal and formal fallacies in arguments;
- Proof and verification;
- Facts, laws and hypotheses;
- Explanation;
- Induction.

The later topics in the course will be treated both formally—i.e., in terms of general logical theory—and also in part historically, with a view to presenting some account of the distinguishing features of science as a special way of thought.

G30.1 LOGIC

A course of thirty-four hours intended as an introduction to both logic and scientific method, but devoted chiefly to logic. The topics are the same as those given under G30 (q.v.), but the earlier topics will be treated more fully than they are in that course.

G30.2 SCIENTIFIC METHOD

A course of thirty-four lectures, for which G30.1 Logic is a prerequisite. The later topics of G30 Philosophy (q.v.) will be treated, together with some topics from those mentioned under G32 Philosophy (q.v.). The topics from G32 Philosophy will be treated with special reference to their exemplification in the social sciences.

G32 PHILOSOPHY

A course of forty-eight hours, for which G30 Philosophy is a prerequisite. The primary aim of the course will be to present a more detailed and more critical account of some of the broad philosophic problems adumbrated in the latter parts of G30 Philosophy. The topics to be treated may include:

- Theories of individuation and generality;
- Theories of persistence and change;
- Determinism and causation;
- The logical status of explanatory concepts and laws;
- Empiricism and rationalism, realism and idealism.

The treatment of the topics will be in part analytic and in part historical.
G33 PHILOSOPHY

A course of sixty-eight hours, including the whole of G30 Philosophy and part of G32 Philosophy (q.v.). If the size of the class permits, alternative versions of the later part of the course will be presented; one presenting some broad philosophical problems in relation particularly to the physical sciences, another presenting these problems in relation particularly to the social sciences.

G34 PHILOSOPHY

(An elective for Commerce students)

An account will be presented of some of the central problems of modern philosophy. The course will begin with a detailed study of one of the most outstanding of recent philosophical works: Gilbert Ryle’s “The Concept of Mind”. Other works will then be referred to as occasion arises.

G41 ECONOMICS

This course of forty-eight lectures is an introductory examination of the working of a modern economic system, with particular reference to “current economic problems”. The main topics are:

1. The National Income: the circular flow; methods of measurement; savings and investment; price changes and price index numbers; national income statistics.

2. Economic Fluctuations: measurement of economic fluctuations; unemployment in the inter-war period; types of unemployment; seasonal and inventory cycles; the trade cycle; industry cycles; long waves.

3. The Trade Cycle: distinguishing characteristics of the trade cycle in Australia; phases of the cycle; role of the multiplier, the acceleration principle and changes in business confidence.

4. Trade Cycle Theories: monetary theory; over-investment theories; harvest theory; psychological theory; Keynesian theory—savings and investment analysis; Kaldor’s model.

5. The Money Economy: definition of money; stages in evolution—barter, commodity money, metallic money, bank-note money, cheque money; functions of money and its role in economic development.

6. The Banking System: origins of modern banks; creation of credit; the instability of “fractional reserve” banking; interest rates.

7. Central Banking: functions of a central bank; objectives of policy; central banking techniques and their application in Australia; recent banking legislation in Australia.

9. International Trade and the Balance of Payments: differences between domestic and international trade; the law of comparative costs; the balance of payments and measures for correcting an adverse balance.

10. The Firm and the Industry: market situations—perfect and pure competition, imperfect competition, pure monopoly; the control of monopoly.

G42 Economics

This course of forty-eight lectures is intended to follow G41 Economics. The course will combine more advanced theory with a detailed study of some aspects of the Australian economy.

The applied study of the Australian economy may include such topics as:

Industry Studies: such industries as iron and steel, transport, coal, wheat and wool.

Wage Determination and the Arbitration System: differences between the arbitration system and collective bargaining; the economic policies of trade unions; incentive schemes.

Public Finance: Commonwealth-State financial relations: the Loan Council and the loan market.

G43 Economics

This course of sixty-eight lectures aims to examine the principles underlying the working of a modern economic system with particular reference to the Australian economy. The main topics are:

1. The Growth of the Australian Economy: the prison farm; pastoral and gold era; industrialisation; our resources and the general economic problem of scarcity.

2. The National Income: the circular flow; methods of measurement; savings and investment; price changes and price index numbers; national income statistics.

3. Economic Fluctuations: measurement of economic fluctuations; unemployment in the inter-war period; types of unemployment; seasonal and inventory cycles; the trade cycle; industry cycles; long waves.

4. The Trade Cycle: distinguishing characteristics of the trade cycle in Australia; phases of the cycle; role of the multiplier, the acceleration principle and changes in business confidence.
5. Trade Cycle Theories: monetary theory; over-investment theories; harvest theory; psychological theory; Keynesian theory—savings and investment analysis; Kaldor's model.

6. The Money Economy: definition of money; stages in evolution—barter, commodity money, metallic money, bank-note money, cheque money; functions of money and its role in economic development.

7. The Banking System: origins of modern banks; creation of credit; the instability of "fractional reserve" banking; interest rates.

8. Central Banking: functions of a central bank; objectives of policy; central banking techniques and their application in Australia; recent banking legislation in Australia.


11. The Theory of Demand: the demand schedule and curve; law of diminishing marginal utility; elasticity of demand.

12. The Theory of Production: the supply schedule and curve; law of diminishing returns; short run and long run supply curves.

13. Analysis of Market Situations: perfect and pure competition; imperfect competition and advertising; pure and perfect monopoly. Social control of industry.

G50.1 GOVERNMENT

This course of thirty-four lectures will be a general introduction to the study of politics, as in G51 Government.

G51 GOVERNMENT

This course of forty-eight lectures will introduce the study of politics—political ideas, institutions and the working of political systems—with special reference to Australia. An attempt will be made to put the Australian system of government in historical perspective and to see where and why the political process here differs from that in other countries.

A general introduction to political theory will also be given through a detailed study of Lord Radcliffe's Reith Lectures of 1951, The Problem of Power, and of supplementary material on the classic political writers to whom he refers.
This second year course is intended to follow G51 and aims at making a fairly intensive study of a special field. If sufficient students so choose, the following topics will be offered as possible courses:

1. Russian Government.
2. International Affairs.
3. Local Government in Australia.

The aim here is to give a general introduction to the study of politics—to range over the whole field so that students will be brought to realise what politics is about and how government works, what different fields of study there are in which more specialised study might be made. For illustration, the emphasis will be on Australian government, but where possible comparative information will be included for discussion concerning Britain, the United States, France and probably Russia or China.

The purpose of a general introductory course in politics or government is to explain "what politics is about, how it is related to other aspects of culture and social existence . . . how government is organised and how it works." (P. H. Partridge.)

In this proposed course there will be some emphasis on the Australian political system, the political institutions here, their methods of working, the ideas about political aims and methods which are dominant, or commonly supported in our society. But always this will be supplemented by comparative information, by reference to other political systems, other important ideas, and by discussion of some of the classic statements of political ideas from the past and in recent political literature.

The present plan is for this course to deal with three aspects of politics and government—

(a) The political machinery; the different institutions through which politics work in different times and places with more detailed study of the political institutions in Australia and the United States.
(b) The political process: an investigation of the dynamics of politics, of the common ways in which political claims are made, upheld, established, or rejected in this and other communities—i.e. of the working of such things as political parties, political interest groups, the influences moulding attitudes and ideas.

(c) Political problems: how far is our political system fixed and determined? How does political change occur? What changes are possible? What might be desired? What are the main political issues facing us at the present time? What criteria can we use to judge between one political method or arrangement and another?

In addition, the study of political ideas will be introduced and put into historical perspective by a study of some of the great political writings of the past. A useful introduction to this will be the study of Lord Radcliffe's *The Problem of Power*.

G61 Psychology.

This course introduces the student to both the subject matter and methods of psychology. He will become acquainted with the body of knowledge which has been systematically derived from the study of the behaviour of man in relation to his environment. This may well lead to a better understanding of the individual, his relations with others, and the customs, conventions and institutions which affect the behaviour of men in society.

The course will stress the importance and all-pervasiveness of motivation, and the functional relations between motivation and the emotions, particularly fear, anger, love and hate. All facets of man's behaviour cannot be discussed in a short course, and thus the treatment must necessarily be selective following an integrated theme which is suited to the needs of the class and the approach of the lecturer.

Among the topics to be discussed will be many of the following: the structural basis of behaviour; individual differences in intelligence, other abilities and personality; the way in which an individual perceives his environment and builds up experience; the process and effective conditions of learning, remembering and thinking; personality development. Frustration and tension, disorganised behaviour and the common ways of meeting these conditions may also be included in the course.

One of the main aims of the course will be to make the student critically aware of the psychological forces within and about him.
G62 Psychology

In this elective the theme of man in society will be taken further. What psychology has to say about personality, the roles which people adopt, the groups people form and the nature of group relations, the effects of interaction, the importance of attitudes, the influence of propaganda and the function of conformity, conventions and customs, will be examined with reference to different kinds of human striving, human satisfactions and values.

G63 Psychology

The outline of this course is the same as that given for G61 Psychology.

G72 Painting, Sculpture and Allied Arts

An elective of 48 hours on the History of Art

This course will include some lectures on the general history of architecture, and some lectures on architectural aesthetics, elementary design and industrial design. The economic, political and social background of each phase will be discussed.

The lectures devoted to the history of painting, sculpture and allied arts will be illustrated by slides of characteristic examples of the major art epochs discussed. The intention is to enable the student to appreciate a work of art in terms of its historical period and the characteristic qualities produced by determining factors of the age. Also it is intended to help him to analyse and appreciate the formal values and intrinsic style of such a work and to enjoy it.

G81 Sociology

This course will be an introduction to the scientific study of the phenomena arising out of the group relations of human beings. The topics studied will include the terminology of modern sociological science; primary concepts such as associations, institutions, communities, customs, folkways and mores; the family; the socialization of the individual; social stratification (with particular reference to Australia); mass behaviour, including the behaviour of publics, crowds, mobs; public opinion, its determinants, measurement, importance and control; social movements, crisis situations and resultant reorganization; population problems, the social implications of changing birth rates, death rates, population changes, immigration, changing standards of living, war and peace; social change, leadership, adjustment in society to changes in technology.

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G82 Sociology

The concept of social class.
Approaches to social class—legally defined classes; economic classes; culture classes; self-conscious classes; participation classes.
The measurement of social class—The Kinsey method determining social level; the Warner method of class participation; the Centers method of securing self-identifications with class.
Studies of class structure.
Some selected class differences in behaviour—child rearing practices; intelligence test performance; educational adjustment; delinquency.

G83 Sociology


G92 History of Science

The course will outline the development of some of the major scientific concepts, especially those arising in the physical sciences. The syllabus given below is intended as an outline and rough indication only: it will be supplemented by lectures drawing together the several topics and bridging some of the gaps between them.
Each member of the class will be expected to undertake some reading of original papers or classical works, to write an essay on a historical topic, and to prepare a short paper for class discussion.
Outline Syllabus
Greek mathematics, astronomy, and physics.
The theory of Copernicus.
Galileo, Newton, and Huygens: the setting up of classical mechanics.
Boyle, Lavoisier, Dalton, and Berzelius: the consolidation of chemical theory.
Quantum theory and relativity.

521
G95 HISTORY AND SOCIAL RELATIONS OF SCIENCE AND TECHNOLOGY

(Elective for final year students of Industrial Arts)

This subject is intended to be much more than a mere collection of biographies and chronologies of discovery and invention. By the close study of some selected case-histories or themes (e.g., the establishing of the Law of Universal Gravitation) it aims:

1. To outline the historical development of some of the central concepts and categories of science.
2. To indicate the mutual influences and interactions of scientific and philosophical conceptions.
3. To give some account of the social, economic and political circumstances that bear upon, and in turn are affected by scientific and technological advance.
4. To clarify the relations between pure science, applied science and technology.
5. To convey an impression of science and technology as essential components of the culture that characterises Western European civilization.
Science Course Subjects

The following Science course electives provided by the Faculty of Humanities and Social Sciences are available at Newcastle University College:

**Geography I (Science)**

*The Methods and Scope of Geography*—Map reading and interpretation; the world pattern and relationships of climate, soil, vegetation and landforms; the cultural geography of the world treated regionally on a continental basis.

Six days of field excursions in the Hunter Valley area.

**Geography II (Science)**

(a) *Cartography*—The problems, uses and limitations of map projection—azimuthal, conical, cylindrical and conventional projections.

Topographic surveying—traversing, levelling, plane tabling.

The course also includes four full-day field exercises.

(b) *Climatology*—The scope and methods of systematic geography.

The climatic record, its compilation, limitation and use. Background to climatic variety, heat balance, atmospheric circulation, air masses, weather sequences, the major climatic elements and their regional contrasts. Problems and methods of climate classification, the concept of precipitation effectiveness, plants and soils as climatic indicators. Climatic change and climatic cycles. Regional climatic variation studies in applied climatology.

(c) *Economic Geography*—The study of economic activities in relation to their environment, particularly with reference to the factors of production.

The geography of agricultural production; cereals, specialised crops such as sugar and cotton, irrigation farming, farming in tropical lands, pastoral production, land and labour problems.

The geography of factory production; sources of power and raw materials, the location of industry, the industrial complex. The geography of transportation with reference to internal organisation and international trade. The geography of population, including variations in distribution and standards of living.

The course also includes seven days’ field investigation of some aspects of economic geography in New South Wales.

**Additional for Honours**

(d) *Methodology in Geography*—The historical development of the subject, modern trends and attitudes, the scope and methods of geography.
The Geography of Soils—Soil morphology, pedogenesis, soil classification and survey of regional soil variety, soil erosion and conservation. This course also includes three days’ field investigation.

Economic Geography—The geography of population and settlement, world population distribution, methods of measuring population growth, the theory of optimum population, migration, town and city studies, the character of rural settlement.

Geography III (Science)

(a) The Regional Geography of “Monsoon” Asia—The scope and methods of regional geography and the application of these concepts to selected areas of “Monsoon” Asia.

(b) The Regional Geography of Australia and New Zealand—The continent as a whole is discussed briefly and then analysed in more detail according to various defined geographical regions. The course includes ten days’ field investigation of regional character or developmental problems in a selected area.

(c) Political Geography—The geographical aspects of states, world political divisions, geopolitics and strategy, internal organisations of the State, problems of external relations, boundaries and frontiers, the control of international waterways, capital cities, colonies and dependent territories.

Additional for Honours

(d) Geographical problems in the development of South-east Asia.

(e) Historical Aspects of Australian Geography—The evaluation of some of the historical factors lying behind the present character, occupations and distribution of the Australian population. Special attention is given to the growth of concentration and centralisation, and to problems of development.

(f) Methods of Geographical Research—The place of field work and field techniques, library research and statistical techniques, the preparation and presentation of research material.

Geography IV (Science)—Honours

A full-time study of Geography in which methods and techniques are established as an approach to geographical research. The main section of this work is the prosecution of an original problem accompanied by field study and the preparation of a thesis.
GRADUATES OF THE UNIVERSITY

The following is a list as at 31st December, 1958, of persons who have been admitted to degrees of the University.

HONORARY GRADUATES

Lieut.-Colonel Sir Charles Bickerton Blackburn, O.B.E., D.Sc. 1952
Frank Symonds Bradhurst, D.Sc. 1955
John Joseph Cahill, D.Sc. 1955
William Edward Clegg, D.Sc. 1955
Arthur Denning, D.Sc. 1957
Robert James Heffron, D.Sc. 1955
Norman Edward Jones, D.Sc. 1955
William George Kett, D.Sc. 1957
James Kenneth MacDougall, D.Sc. 1955
Maurice Alan Edgar Mawby, D.Sc. 1955
Robert Kenneth Murphy, D.Sc. 1957
The Rt. Hon. The Viscount Nuffield, O.B.E., D.Sc. 1952
Marcus Lawrence Elwin Oliphant, D.Sc. 1952
Cobden Parkes, D.Sc., 1958

GRADUATES

DOCTORS OF PHILOSOPHY

Backhouse, James Roy, 1958
Baker, Stanley Charles, 1958
Barnes, Geoffrey Thomas, 1958
Bowling, Keith McGregor, 1955
Brettle, Horace Joseph, 1958
Briggs, William Robert, 1956
Bryson, Alexander, 1957
Buchanan, Robert Hawkins, 1955
Cairns, Robert Charles, 1955
Connors, Francis Leslie, 1958
Courtney, John Lawrence, 1957
Cranmer, Venn, 1957
Csanady, Gabriel Tibor, 1958
Fielding, Peter Eric, 1957
Figgis, Brian Norman, 1956
Gilby, Aclation Ross, 1956
Gilham, Peter Thomas, 1957
Harris, Clive Melville, 1955
Hopkins, Edward Goodman, 1955
Johnston, Arthur Kerr, 1957
Keane, Austin, 1956
Lawrence, Laurence James, 1956
Livingstone, Stanley Edward, 1955
McCartney, Eric Robert, 1956
McConnell, Jack Foster, 1958
McHugh, Dennis Joseph, 1957
Madgwick, George Graham, 1957
Magnusson, Eric Alfred, 1957
Maguire, Mary Helen, 1956
Ralph, Raymond Keith, 1958
Robins, Robert George, 1958
Roper, Geoffrey Harold, 1956
Sutton, Gervaise John, 1956
Tetaz, John Robert, 1956
Warner, Noel Alfred, 1958
Warner, Ronald Kenneth, 1955
Werner, Ronald Louis, 1957
Young, Ronald Jerome, 1958
Zahid, Mohammad Saeed, 1957
MASTERS OF SCIENCE

Anand, Jagdish Chandar, 1955
Anderson, Anders John, 1958
Anderson, John Ragnar, 1953
Armstrong, John McDougall, 1958
Aylward, Gordon Hillis, 1954
Aysegh, Frederick William, 1957
Barbour, Robert Gavin, 1958
Beckmann, Peter, 1955
Bendit, Ernest George, 1955
Bown, Leonard Oswald, 1954
Choudhry, Mohammed Siddique, 1958
Connors, Francis Leslie, 1954
Cooke, Colin Garland, 1957
Costoulas, Aristotle John, 1958
Dintenfass, Leopold, 1958
Donegan, Henry Arthur, 1955
Fletcher, Harold Oswald, 1957
Flynn, Thomas Desmond, 1958
Ford, Douglas Lyons, 1954
Fowler, Herbert, 1956
Garnett, John Lyndon, 1954
Gatehouse, Bryan Michael, 1956
Golding, Henry George, 1957
Griffith, June Clare, 1956
Hall, Lennard Robert, 1958
Haly, Alan Robert, 1958
Hansen, Norman Reginald, 1956
Hatherley, Max, 1956
Hellyer, Robert Owen, 1958
Hewitt, Bernard Robert, 1957
Hughes, Thomas William, 1957
Humphreys, Frank Reginald, 1957
Irwin, Robin Carol, 1958
Kapur, Narinder Singh, 1955
Kirschner, William George, 1955
Lark, Prosper David, 1957
Lederer, Josef, 1956
Locksley, Harry David, 1957
Lowenthal, Gerhard Clause, 1958
Lynch, Alban Jude, 1958
McKern, Howard Hamlet, 1957
Martin, Cyril Maxwell, 1953
Melonney, Harold Francis, 1954
Miklouho-Maclay, Robertson Wentworth de, 1956
Mirza, Meftahul Ahmed, 1955
O’Neill, Dermott Kevin, 1958
Ozcan, Kazim, 1957
Parry, Lindsay George, 1955
Pickering, William Frederick, 1956
Powning, Rodney Francis, 1953
Ratcliffe, John Spurgeon, 1957
Rauf, Abdur, 1956
Rayner, Edward Oswald, 1957
Rigby, Bernard John, 1957
Robins, Robert George, 1955
Roper, Geoffrey Harold, 1953
Roulston, William James, 1958
Schwartz, Alfred, 1958
Solomon, David Henry, 1955
Sreemulanathan, Harihara, 1955
Steele, Maxwell Campbell, 1956
Sugowdz, Galina, 1955
Sullivan, John Leslie, 1956
Sutton, Gervaise John, 1953
Taneja, Gopi Chand, 1954
Waterman, Hanneke, 1958
Waugh, John Blake, 1957
Weiler, Hans, 1956
Werner, Ronald Louis, 1953
Whiffen, Neville Albert, 1956
Williamson, William Harold, 1957
Winter, George, 1957
Young, Sydney Sze Yih, 1956

MASTERS OF ENGINEERING

Betz, Eric, 1957
Bryant, Raymond Alfred, 1957
Burdon, Russell George, 1954
Faulkes, Kenneth Alan, 1958
Glucharoff, Todor, 1958
Ryan, Paul William, 1958
Saeed-ud-Din, 1957
Sapsford, Charles Matthew, 1958
Shrivastava, Krishna Kumar, 1955
Wallis, Raymond Allan, 1954
Warner, Robert Falcon, 1957
Weiss, Kurt, 1958
Welch, Geoffrey Baldwin, 1957
Wood, Ian Ruthven, 1958
Woodhead, Ronald William, 1957

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MASTERS OF ARCHITECTURE

Greenslade, Anita Barbara, 1957
Phillips, Ralph Oswald, 1956

BACHELORS OF SCIENCE

Abimauju, Bambang, 1956
Aggett, Jack Stanley, 1958
Anderson, John Ragnar, 1952 *
Anderson, John Robert, 1952 *
Anderson, William John, 1955
Andrews, Albert Henry, 1958
Anstee, Sydney Alfred, 1958
Avis, Edward Arthur, 1957
Aylward, Gordon Hillis, 1952 **
Barker, Norman Thomas, 1956
Barnhill, Stanley Robert, 1957
Barratt, Kenneth Victor, 1957
Barry, Walter James, 1956
Basden, Kenneth Spencer, 1955
Bates, William Alexander, 1957
Batterham, Thomas James, 1958 **
Beattie, Roger Ernest, 1955 *
Beauchamp, Herbert, 1953
Belcher, Charles Brian, 1955
Bellingham, Andrew Irwin, 1952 **
Berman, Graeme Walton, 1958
Bitmead, Ronald Charles, 1954 **
Bliss, William John, 1955 **
Bloomfield, Barry John, 1957
Boedihardjo, Otto, 1958 **
Bollinger, Peter Cameron, 1957
Bolton, Robert John, 1956
Bostrom, John, 1957
Bowering, Keith McGregor, 1952 **
Boyce, John Peter, 1956 *
Bradley, Robert Burton, 1957
Bradwell, John Edward, 1957
Brent, Ernest Harold, 1957 *
Brieger, Klaus Martin, 1958
Briggs, William Robert, 1952 **
Bryant, David Lindsay, 1958
Buckman, Edmund James, 1955 **
Buist, Ronald Victor, 1958
Bulathsinghala, Don Milton, 1956
Burgess, Ian Glencross, 1958
Burrell, George Albert, 1956

* Honours Class I
† University Medal.
** Honours Class II
BACHELORS OF SCIENCE—continued

Dewhurst, Ian Stanley, 1956
Dogan, Francis Leon, 1956
Donaldson, Janet Ruth, 1958
Donnan, Reginald Carson, 1954 **
Donovan, Patrick James, 1958
Dossetor, John Vinson, 1958
Doyle, Robert Wilfred, 1957
Draper, Graham Richard, 1956 **
Duesbury, Ross Malcolm, 1956
Dunning, John, 1957
Edmonds, Walter Henry, 1957
Edwards, Ronald Alexander, 1956 *
Ezer, Charles David, 1958
Fardy, John Joseph Matthew, 1958
Farrington, Keith John, 1956
Fenner, John Raymond, 1953 *
Filson, Arthur Cole, 1953
Findlay, Anthony Walter, 1957
Fisher, Philip, 1957
Fitzpatrick, Brian Patrick, 1958
Flanagan, John Terrence, 1958
Fletcher, Walter Maurice, 1953
Florence, Trevor Mark, 1958
Flynn, Thomas Desmond, 1955
Ford, Geoffrey Hunter, 1955 **
Foster, Neville Russell, 1958
Gammie, Keith Robert, 1958
Garnett, John Lyndon, 1952 **
Garvin-Smith, Shirley Gladys, 1956
George, Colin Walter, 1955
Gilmore, Harry, 1958
Glasssey, Alan Rhodes, 1957
Gohl, Erhard Paul, 1956
Golightly, David Rankin, 1956
Gorman, Harry James, 1958 **
Graham, Arthur Alexander, 1958
Graham, Bruce Malcolm, 1954 **
Graham, Clifford Arthur, 1957
Graham, Edward Joseph, 1957
Grahame, Frederick William, 1955
Grainger, Terence John, 1958
Green, Alan Rae, 1954
Greenwood, John William Neville, 1958
Gregory, Roy Thomas, 1956
Griffin, Peter Grenville Thomas, 1958
Griffith, June Clare, 1952 **
Guest, Graeme Beresford, 1958 **
Guiffre, Vincent, 1954 **
Gwatkin, Edward Alan, 1955
Haken, John Kingsford, 1957
Halsey, Reginald Beres, 1958
Harland, John Dureau, 1955
Harper, Kevin Anthony, 1957 **
Harris, Alan John, 1958
Harris, Arthur Robert, 1958
Harris, Clive Melville, 1952 **
Harris, Douglas Clive, 1958
Harrison, Barry Leigh, 1955
Harry, John Raymond, 1955 **
Hart, Richard John, 1958
Holleyer, Robert Owen, 1955
Henderson, John Barry, 1958 *
Henry, Brian David, 1958
Herwig, George Lang, 1956
Hibberd, George Edward, 1957 †
Hill, Peter William, 1957
Hinterberger, Hertha, 1957 *
Holland, Bruce Owen, 1957
Hughes, Donald Bruce, 1955
Humphries, Robert William, 1958
Hunt, James Herbert, 1953
Hunt, Kenneth Richard, 1955 **
Hyslop, Donald, 1957
Johnson, John Wentworth, 1954
Johnson, Keith John, 1952
Johnston, Andrew Gordon, 1955
Johnston, Gordon Basil, 1956
Johnstone, Cyril David, 1957
Jones, Thomas Alwyn, 1956
Jones, Warwick Leonard, 1953 **
Kaufman, Jack, 1958
Kennard, Colin Harold, 1956
Kennedy, John Patrick, 1957 **
Kennedy, Richard Edmond, 1955 **
Kenny, Peter, 1957 *
Kerr, Andrew Colin, 1958 *
Kerr, Jeffrey Lionel, 1958
King, Allan Roy, 1953 **
Knispel, Charles Christian, 1958 *

* Honours Class I
† University Medal
** Honours Class II
BACHELORS OF SCIENCE—continued

Kokot, Ernest, 1957 **
Kornis, Gabriel, 1958 **
Lamons, Hans, 1958
Lamond, Maxwell James, 1956 **
Lane, Warwick Manning, 1957
Langby, Claude William, 1957
Lark, Prosper David, 1952 **
Lathlean, Barry, 1956 **
Lawson, Frank, 1955 †
Lean, John Barry, 1955
Lee, Frederick Thomas, 1957 **
Lee, John Barry, 1957
Lee, John William, 1957 *
Lee, Vincent, 1955
Little, Alec George, 1955 *
Little, Lambert Ronald, 1954
Livingstone, Stanley Edward, 1952 *
Locksley, Harry David, 1955 **
Lockyer, Trevor Norman, 1957
Lovel, Derek Campbell, 1957
Lynch, Alban Jude, 1956 **
Lynch, Patrick William, 1958
McBrien, Basil Patrick, 1958
McDougall, Peter George, 1956
McInnes, Peter Aloysius, 1958
McKay, Harry David, 1957
Mackie, James Alexander, 1953
McLaren, Keith Gerrard, 1958 *
McMaugh, William John, 1958
Macmillan, James, 1952 **
Macmillan, William Pattie, 1958 †
McNaught, James Stewart, 1955 **
Madden, Barry George, 1956 **
Madgwick, George Graham, 1954 **
Malin, Anthony Samuel, 1958 *
Manners, Vincent John, 1955
Mansberg, Emanuel, 1954
Martin, Norman, 1958
Martin, Ronald Hugh, 1954
Mead, Murray, 1953
Miceli, Michael John, 1956
Miller, Charles James, 1953 **
Miller, James, 1957
Mills, Sylvester Colin, 1958
Milne, John Warren, 1956
Moor, Beresford Christopher, 1958
Moore, Michael Nean, 1957
Moran, Vincent John, 1955
Morrant, Alan James, 1955
Morris, Maxwell George, 1953
Morrison, Alexander John, 1953
Morrison, Barry Leonard, 1956
Mowbray, Gordon, 1958 **
Mowbray, William, 1957
Muir, Andrew, 1958
Muir, Peter Lawrence, 1956
Muller, Ross Leslie, 1957 *
Napier, Keith Hamilton, 1957 *
Nusseric, Dick, 1958
Neill, Barry Vincent, 1956
New, George, 1956 **
Newton, Alexander, 1956
Nickson, Brian John, 1955
Noller, Charles Geoffrey, 1958
Noonan, Denis Edward, 1958
Nordon, Peter, 1954 †
Norman, Joseph, 1953 **
O'Brien, Reginald William, 1956
O'Connor, Michael Wetherill, 1954
O'Donnell, John Michael, 1957
Oglethorpe, Bruce James, 1954
Oom, Peter John, 1957
Ozols, Gunars, 1956
Paddison, Barry Arthur, 1953
Palmer, Eric Francis, 1958
Passmore, Brian Victor, 1958
Perry, Peter Patrick, 1954 **
Philipp, Donald Henry, 1957
Pickering, William Frederick, 1952 *
Pilkington, John Thomas, 1952 **
Powell, Graham Leonard Fraser, 1958
Powitt, Albert Henry, 1957
Pratten, Christopher Hugh, 1956
Prince, Roger Oliver, 1956 **
Purches, Frederick Walter, 1953
Purss, Alan Stanley, 1953
Pyke, Bruce Henry, 1958 **
Pym, Ronald Kenneth, 1954
Reece, Ian Harold, 1956
Rhoades, Gerald Frederick, 1956
Robbie, Ian Stuart, 1957
Roberts, John, 1958 **

* Honours Class I
† University Medal
** Honours Class II
Roberts, Peter Kingsman, 1958
Robins, Harold George, 1955
Robins, Robert George, 1953 **
Rodrigo, Tennyson, 1955
Rogers, George Maxwell, 1958
Rogers, William Robert, 1956
Roscoe, Noel Edward, 1956
Ross, Frederick Harold, 1956
Rossler, Ludviek Peter, 1955
Routley, Walter Laurence, 1954
Rudzats, Richards, 1958
Salasoo, Inno, 1957
Samios, John Morris, 1958
See, Graeme Thomas, 1955
Sharkey, Ernest Stephen, 1957
Shaw, Keith Hamilton, 1958
Shearer, Albert William, 1958
Siddins, Joseph Charles, 1957
Skidmore, John Anthony, 1953 **
Skinner, David Henry, 1958
Skinner, John Norman, 1957 **
Smith, Harold James, 1958 **
Smith, James Davidson, 1952 **
Smith, Malcolm Bruce, 1956
Smith, Maurice Edward, 1957
Smith, Ronald David, 1956
Snape, Trevor Alfred, 1957
Soeparwadi, 1958
Solomon, David Henry, 1953 **
Somers, Malcolm Leonard, 1958
Spedding, Peter Lee, 1958 **
Steames, John Ellington, 1958
Stein, Alan Walter, 1956
Stephen, Bruce William, 1957
Stephen, Wallace, 1952
Stephens, Geoffrey Malcolm, 1957
Stewart, Colin Crosbie, 1958
Stimson, Alan Keith, 1958
Stoddart, Norman Thomas, 1955 **
Sutton, Gervaise John, 1952 **

Swinbourne, Ellice Simmons, 1952 *
Symons, Douglas Ross, 1958 **
Szumer, Adam Zygmunt, 1957 *
Talty, William Watson, 1958
Taylor, Francis Joseph, 1957
Taylor, Peter Charles, 1958
Thompson, Raymond George, 1956
Thorburn, Trevor John, 1958
Tindale, Brian Earl, 1957
Todhunter, John William, 1957
Tortillo, Rex Louis, 1956
Tschoegl, Nicholas William, 1954 **
Udomsakdhi, Bancha, 1957
Upjohn, Robert George, 1954
Uhrig, John Allan, 1958
Vail, Noel Walter, 1957
Walker, Alan John, 1957
Walker, Lloyd Herbert, 1958
Wall, Geoffrey Craig, 1954 **
Wallwork, Greig Richard, 1956
Walpole, Ernest Allan, 1953 **
Warner, Noel Alfred, 1953 *
Warner, Ronald Kenneth, 1952 †
Watton, Edward Charlton, 1957 *
Waugh, Clyde Todhunter, 1957
Weare, Berris Rodner, 1957
Webster, Alexander MacDonald, 1956
Werner, Ronald Louis, 1952 †
Wheeler, Ramsey Moore, 1958
Whidden, Fredrick Ross, 1956
Whitley, Kenneth James, 1955 †
Whitfield, David, 1956
Whitfield, Frank Brierley, 1958 *
Williams, Barry Edgar, 1958
Williams, Eric Joseph, 1955
Williams, Lloyd, 1958
Wilson, Douglas Harold, 1956 **
Wolfenden, Jack, 1953 **
Worrall, Robert Grant, 1958
Wright, William James, 1955

* Honours Class I
† University Medal
** Honours Class II
BACHELORS OF SCIENCE (OPTOMETRICAL SCIENCE)

Amigo, George, 1956 *t
Asgar, Asad Ali, 1957 **
Bennett, Norman Boutflower, 1957
Bromley, John Thomas, 1956 **
Brown, Colin Robert, 1956 *t
Cleworth, Richard Henry, 1958
Fulthorpe, Neville Alfred, 1957 **
Harvey, Kelvin Richard, 1957 **
Herbert, Kenneth Cyril Royston, 1958
Layland, Brian, 1958

Micheletti, Peter Albert, 1958
Pedersen, Melville Roy, 1957
Ryman, Leslie Alfred, 1957
Simpson, John Arthur, 1957
Thomas, Penrhyn Francis, 1957
Tucker, Jeffrey Ernest, 1957
Walker, Burnett Fenwick, 1957
Webb, Jack Barrie, 1957
Williams, Owen Ashley, 1956

BACHELORS OF ENGINEERING

Algie, John Edgar, 1957
Allen, Arthur Francis, 1955 **
Ambrose, Charles Walter, 1957
Anderson, Basil Wolfe, 1953
Ang, Arthur, 1957
Argue, John Robert, 1955
Armstrong, Ernest James, 1958
Atkinson, Henry Waldon, 1958
Audova, Henry Jaan, 1957 **
Bagust, Leslie John, 1954
Baker, Bernard William, 1953
Baker, John Morton, 1952
Baker, Lloyd Sydney, 1953 **
Bason, Peter Thomas, 1954 **
Baxter, Robert Ian, 1957
Beard, John Russell, 1957
Beath, James Norman, 1955 *
Bell, Andrew John, 1954
Bennett, Charles, 1956
Bloxham, William Henry, 1955
Body, David Neil, 1958
Bofinger, Harold Edward, 1958
Bowman, Alistair Stuart, 1958
Brady, Colin James, 1957
Brady, John Travers, 1957
Britten, Donald Barrie, 1955 **
Brodie, Hugh David, 1957
Brook, Joseph Frank, 1958
Brookes, John Douglas, 1953
Brooks, James Junior, 1954 **
Brown, Ian Powell, 1958 **
Browne, Lindsey Edwin, 1957
Buchhorn, Richard James, 1954 **

* Honours Class 1.
† University Medal
** Honours Class 11
BACHELORS OF ENGINEERING—continued

Corin, Richard Arthur, 1956
Cox, Allan, 1952
Cox, Geoffrey Earl, 1954
Cox, Malcolm Ashton, 1957
Coyle, John, 1956
Cranny, Gerald King, 1952
Crawford, George, 1955 *†
Cridland, Leslie, 1956 **
Cromarty, Campbell George, 1954 *
Crowe, John Phelps, 1956
Crowley, Theodore Arthur, 1958
Cunningham, Robert Andrew, 1957
Darby, William Edward, 1954
Davey, Clyde Leslie, 1952
Davis, Leslie James, 1955
Davison, Clem Newton, 1953 *
De Ferranti, Noel Lancelot, 1953 **
Dembecki, Januzy Adam, 1955 *†
De Vos, John Garthneill, 1954
Donovan, John Anthony, 1954
Douglas, Arthur Gordon, 1953 **
Downey, John Phillip, 1958
Downie, James Mott, 1956
Drake, Darryl Ashley, 1958
Dudgeon, Colin Raymond, 1954 *
Duncan, John Charles, 1952
Duncan, Ronald Stewart, 1955
Dunk, Sidney Albert, 1953
Durkin, Thomas, 1953
Eagles, Mervyn Royce, 1956
Edmunds, Robert Lee, 1958
Eldridge, Thomas Maxwell, 1958 **
Ellem, Neville James, 1956
Elliott, David John, 1955
Ellison, David Frederick John, 1958
Emslie, Norman Arthur, 1952 **
Engel, John Griffths, 1954
Evans, David Armstrong, 1958
Evans, Malcolm Wesley, 1954 **
Faulkes, Kenneth Alan, 1955 **
Faulks, John Erskine, 1955
Fekete, Paul Harry, 1952
Fennell, Lance Sidney, 1957
Fietz, Trevor Regis, 1956 *
Findlay, Kenneth Francis, 1952
Fletcher, Ronald Joseph, 1954
Forbes, Cecil Frederick, 1953
Forsythe, John Harold, 1952 **
Freeland, Colin William, 1954 **
Frost, Raymond John, 1956 **
Fu, Chiao Shen, 1956 **
Gan, Thomas Eng Siew, 1958
Gardner, Francis John, 1952 **
Garrity, Paul Everard, 1955
Gately, Kevin Gerald, 1958 **
Goh, Xavier Khen Wah, 1958
Goldhammer, Arthur Brian, 1956
Gorbunow, Miroslaw George, 1958
Gore, Gerard, 1955 **
Graham, David Griffith, 1958 **
Graves, Stanley Noel, 1956
Grieve, Bruce Leslie, 1956
Griffith, Kenneth John, 1954
Grimshaw, William Lindsay, 1958
Halewijn, Ernest Henri Emilie, 1958
Hamilton, Humbert Edward, 1956
Hampton, John Douglas, 1956
Hands, Errol Bruce, 1955 *
Harant, Heinz Richard, 1955 **
Harrison, Colyn, 1954
Hay, Desmond Joseph, 1955
Hazell, William Maitland, 1957
Hill, Leslie Charles, 1954 **
Hillier, Kenneth Richard, 1958
Hind, Edward Colvyn, 1957 **
Hirsch, Paul Heinz, 1955 **
Hislop, Alan Keith, 1953 **
Hitchcock, Robert Leith, 1957
Hogg, Ross William, 1954
Holmes, William Harry Glennie, 1958
Home, Robert Lindsay, 1955 **
Hood, Russell, 1957
Hopkins, Edward Goodman, 1952 *
Howard, Kevin Charles, 1958
Hoy, Mervyn Douglas, 1957
Hulscher, Frans Rudolf, 1957
Irvine, Kenneth Robert, 1956

* Honours Class I  † University Medal  ** Honours Class II
BACHELORS OF ENGINEERING—continued

Irving, Alastair John, 1957
Ivashkoff, Igor Boris, 1956
Ivers, Geoffrey Ainsworth, 1958 *
Jackson, Kenneth Arnold, 1957
Jacobs, James Arthur, 1952
Jaggar, Frank Edwin, 1957
Jan, Kevin, 1956
Jenkins, Bruce Edward, 1954
Jessep, Peter Edwin, 1958
Johnson, Richard Colin, 1957 **
Johnston, Gordon Ronald, 1958
Johnstone, Clifford Owen, 1956
Jones, James Robert, 1958
Jones, John Hunter, 1958 **
Jones, Peter George, 1958
Joseph, Ronald Stanley, 1956
Jubelin, Keith Russell, 1953 **
Jumikis, Tautmilia Tom, 1955
Kadak, Ado, 1957
Kay, James Neil, 1957
Kennedy, Graeme Alexander, 1958 **
Kefford, Michael Owen, 1954 **
Keith, Ronald James, 1952 **
King, Frederick Joseph, 1957
Knight, John Kendall, 1958
Koif, Simon Cornelis van der, 1956 *
Kolsky, Vaclav George, 1958 **
Kuru, Ago, 1956 **
Kuter, Daniel Marie, 1957
Lamb, Cedric St. John, 1956 *
Lamb, Rodney Donald, 1956
Laurenson, Eric Marwick, 1953 *
Leary, Brian Gilbert, 1958 *
Lee, Siaw Phin, 1956
Lee, Thomas Woon, 1956
Leezer, Robert Claus, 1956
Leng, William Nelson, 1956 **
Lennon, Ross Mathew, 1956 *
Leverett, Ronald Arthur, 1954
Lincy, George Herbert, 1954 **
Liston, Clive Shannon, 1954
Long, Frederick Charles, 1955
Louwersen, Pieter Van, 1953
McBean, Donald John, 1955
McCallum, Donald Sloman, 1955
McCarty, Ronald George, 1956 *
McCoy, Albert Edward, 1953 **
McDermott, Arthur Brian, 1958 **
McDonald, Errol Christopher, 1958 *
MacDougall, Duncan Norman, 1957 **
McEwen, Robert Cleland, 1958 **
McGuinness, William John, 1953
McIntosh-Harris, Stuart, 1953
McKenzie, Gordon Alan, 1954 **
McKilligan, Ranald Scott, 1957
McLennan, Dennis James, 1958 **
Macnab, David Keith, 1958 **
McNair, Keith, 1954
McNeal, Malcolm Richard, 1953
McNeill, Donald John, 1953 *
McNeill, Geoffrey William, 1952 **
McPhee, David George, 1953
MacPherson, Ian Peter, 1958
Maggs, Ian Harold, 1957 **
Magnussen, Walter Harold, 1956 **
Magnusson, David John, 1957 **
Maino, Raymond John, 1958
Malins, James Arthur, 1957
Mann, Edward Alan, 1956
Manton-Hall, Arthur William, 1953 *
Marr, Donald William, 1958
Mathew, Alexander Michael, 1958
Mathews, Michael Richard, 1955
Matthews, Leonard Excel, 1953
Mayhew, Roger Alban, 1957
Mega, George, 1954
Melville, David James, 1958
Meulman, Peter Boyce, 1952
Meulman, Richard Boyce, 1957
Milne, Bruce Campbell, 1957
Moloney, James Laurence, 1958
Mondel, Robert Henry, 1952 *
Monk, Geoffrey, 1955
Moore, John Eric, 1955
Moreton, John Preston, 1956
Morgan, Robert James, 1955 *
Morrow, Darrell Elwyn, 1954 **
Mudd, Peter Douglas, 1958 **
Muir, Mitchell James, 1952 **
Mullen, Raymond Owen, 1956

* Honours Class I
† University Medal
** Honours Class II
Murch, James Bryan, 1956
Murray, John Bloxham, 1952
Nagy, Andrew Francis, 1957 **
Nelson, Gordon Darvey, 1957
Nestel, Thomas Alexander, 1954
Newman, Aubrey Gavin, 1958
Newton, Donald Thomas, 1956
Newton, Trevor Arthur, 1954
Nicholls, Maxwell James, 1957
Nittim, Ein, 1956
Noble, Bruce Kennedy, 1953
Nolan, Richard Charles, 1956
Oberg, Donald Gordon, 1957 **
O'Brien, Kenneth Robert, 1952
O'Dwyer, Joseph Aloysius, 1954 **
O'Loughlin, Emmett Michael, 1958 **
O'Neill, Peter John, 1957 **
Orlovich, John, 1957
Owers, Noel Francis, 1958
Page, Ernest Thomas, 1957
Page, William George, 1952
Panozzo, Livio, 1956
Parr, Colin Robert, 1958
Partridge, Alan Arthur, 1955
Paterson, John Lindsay, 1957
Pearce, Noel, 1956
Pengilley, Cecil John, 1954 **
Penhall, Brian William, 1955 **
Petersen, Robert Keith, 1954 **
Pierce, Eric William Thomas, 1958
Pierce, John Harold, 1958
Piggott, Terry Leicester, 1957
Pilgrim, David Herbert, 1953 †
Pillay, Ratnam Kandaswamy, 1956 **
Pines, Michael Thomas, 1956
Pittaway, Malcolm Lyle, 1956 **
Planner, John Henry, 1958
Pok, Sheung Yee, 1958
Potter, Kenneth, 1957 **
Purnell, John Arthur, 1957
Quah, Choon Huat, 1957
Quek, Seng Hin, 1957
Quinlan, Kevin Joseph, 1952
Rabbidge, Bruce Francis, 1953 *
Ranaweera, Piyasiri Senaratne, 1955
Randoja, Michael, 1958
Ray, John William, 1955
Ray, Keith Morris, 1957 †
Rayner, Peter Chorley, 1957 **
Rea, Brian Laurence, 1955
Reidy, Noel Aloysius, 1955
Rheinberger, Brian Philip, 1955
Richards, Owen John, 1954
Riding, Kenneth Wilmot, 1958
Roberts, Alan William, 1956 *
Robinson, David Harold, 1953
Rogerson, Raymond Louis, 1952 **
Rolley, Alexander James, 1952
Rossiter, Peter Thorne, 1953 *
Roth, Dudley Lawson, 1956 **
Rozenauers, Alfred, 1955
Ryan, Kenneth, 1957
Ryan, Peter Michael, 1957
Saiva, Guntars, 1955
Salkeld, Leonard John, 1958
Sampson, William Alan, 1954
Samsa, Stanley, 1958 **
Sands, John Richard, 1957
Saunders, Desmond, 1955
Saunderson, David Mervyn, 1954 **
Savage, Darrel, 1955
Savage, John Milton, 1956 **
Schultz, Paul, 1957
Sellick, Keith Smedley, 1958 **
Sharpe, Gordon Brian, 1955
Shaw, David Lachlan, 1953 **
Shields, Graham John, 1954
Silva, Eric James, 1956 **
Sivagnanam, Thambipillai, 1958
Slater, Rodney James, 1958
Smart, Ronald George, 1954 †
Smith, Malcolm John, 1953 **
Smythe, Ronald Leslie, 1957
Somervaille, Ian James, 1952 **
Southwell, John Carlyle, 1953
Spence, Ian Keith, 1958
Spencer, Lance Clifford, 1952 **
Spratt, James William, 1957
Stein, Frederick Adrian, 1956

* Honours Class I
† University Medal
** Honours Class II
BACHELORS OF ENGINEERING—continued

Stewart, Donald John, 1957
Stewart, John Leonard, 1958 **
Stokes, Stanley Seddon, 1958
Strong, James Arthur, 1952
Stuart, Alexander Robertson, 1958
Stutchbury, Geoffrey James, 1955
Sugden, John Vivian, 1955
Sutherland, Gordon Anthony, 1953
Tan, Kiah Tong, 1958
Taylor, Graham Roy, 1955
Taylor, Victor Michael, 1957
Thieben, George, 1957
Thorpe, Peter, 1953
Ticehurst, Jack Stanley, 1955
Tognetti, Keith Phillip, 1954
Toppler, Jeno Frank, 1958
Uebel, Royde Murray, 1955 **
Upfold, Robert William, 1955 **
Vainomae, Arvi, 1955 **
Vesilo, Kusta, 1958
Waddell, John Stanton, 1958 **
Wade, James Tomes, 1958
Walker, John Allan, 1952 **
Walker, Neil William, 1954
Wallace, Alan Macdonald, 1955
Wallace, Harry Lachlan, 1955
Wallyn, Robert Eric, 1958
Ward, Geoffrey, 1952
Waring, John Mead, 1956
Warner, Robert Falcon, 1955 **
Warren, John Daniel, 1953 **
Watson, James Herbert, 1957 **
Wells, Alan John, 1954
Wenham, Brian Godfrey, 1958
Whatham, John Frederick, 1958
Whatham, Robert Parry, 1956
Wheeler, Geoffrey Walter, 1956
Wheeler, William Raymond, 1952
White, Maxwell William, 1952 *†
Whitting, Alan Charles, 1954
Widdup, Alfred James, 1955
Williams, Leo Roy, 1956
Williams, Robert Carl, 1954 **
Williams, Roy Arnold, 1956 **
Willing, Keith Robert, 1954
Winton, John Edward, 1958 *
Wong, Lock Seng, 1957
Woodman, Douglas Robert, 1958
Wooldridge, John Brian, 1957
Wotton, Frederick Robert, 1953 *
Wright, Leonard, 1952
Young, Edmund, 1953
Young, Robert Forbes, 1958

BACHELORS OF ARCHITECTURE

Allen, David Bradley, 1957
Behue, Stuart Edmond, 1958 **
Chan, Edwin Chin Tan, 1958 **
Chen, Lawrence Li-Chih, 1957
Colman, James Stanley, 1957
Devine, Ronald Harry, 1957
Drake, Barrie Lawrence, 1958 **
Fuller, George Gordon, 1958 **
Greenslade, Anita Barbara, 1955 *†
Lodens, Ilmars Karlis, 1956 *
Mack, Edward Carrington, 1958
McKay, Ian David, 1955
Meadows, Ronald, 1955
Mjadreis, Arnolds, 1957 **
Moore, John Dudley, 1956
Newman, Kenneth Moreton, 1955
Perm, Vladimir, 1957 **
Rice, Kevin James, 1955 **
Statzenko, George, 1958 **
Stone, George Barry, 1958
Wong, Wai Ying, 1957

* Honours Class I  † University Medal  ** Honours Class II
REPORT
of the
COUNCIL OF THE NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY
For the year ended 30th June, 1958

The Council of the New South Wales University of Technology in pursuance of the provisions of section 47 (1) of the Technical Education and New South Wales University of Technology Act, 1949-1955, has the honour to transmit to the Minister for Education the following report upon the proceedings of the University during the period of twelve months ended 30th June, 1958.

General

The most important event of the year for the University, as it was for all the Australian universities, was the report submitted to the Commonwealth Government by the Murray Committee on Australian Universities, and the general acceptance by the Commonwealth Government of its recommendations. The Committee's report dealt with a wide range of problems associated with the Australian universities and proposed recommendations towards their solution. Perhaps the most fundamental of these recommendations was the proposal to establish a University Grants Committee to assess periodically the needs of the Australian universities and to advise the Commonwealth Government on their financial requirements. The Committee considered that it would require some three years for the Grants Committee to become operative, and recognising the urgent need of the universities, itself recommended the provision of additional financial assistance during the intervening period. The University is indeed grateful to the Commonwealth Government for its adoption of the financial recommendations of the Murray Committee, and also for the State Government's assurance that the level of State assistance will be such as to allow the University to qualify for the maximum Commonwealth grants.

During the year the University has continued to develop all major branches of its activities. The range of courses available to students at both undergraduate and graduate levels has been extended while in the field of research many new projects have been commenced. Enrolments in degree and diploma courses have continued to rise and the extensive programme of special and graduate courses conducted during the year was well supported.
Enrolments for 1958 are summarised in the table below and these figures show increases in all categories over the figures for 1957. For example, this year's figure of 5,065 students in first degree and diploma courses compares with 4,351 in 1957. Enrolments in Arts courses at Newcastle University College have also risen from 193 last year to 222, while candidates registered for higher degrees this year number 251, as against 214 in 1957.

**ENROLMENTS—1958**

1st Degree and Diploma Students (other than Arts)—

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<tr>
<th></th>
<th>Full-time</th>
<th>Part-time and Conversion</th>
<th>Total</th>
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<td>1,164</td>
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<td>3,901</td>
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<tr>
<td>Total</td>
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Arts Students (Newcastle University College)—

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<th></th>
<th>Bachelor of Arts</th>
<th>Master of Arts</th>
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<td>217</td>
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<td></td>
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<td>5</td>
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<tr>
<td>Total</td>
<td></td>
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<td>222</td>
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Higher Degree Students

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<tr>
<th></th>
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<th>251</th>
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Total students proceeding to degree or diploma 5,538

Other Students—

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<tbody>
<tr>
<td>Miscellaneous Subjects</td>
<td></td>
<td>Special and Graduate Courses</td>
<td>783</td>
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<tr>
<td>Total other students</td>
<td></td>
<td></td>
<td>968</td>
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</tbody>
</table>

**Grand Total**

|                           |                        |                    | 6,506   |

During the year a number of new undergraduate courses were introduced and conditions governing the award of two additional higher degrees were approved. In 1958, a full-time degree course in Industrial Arts was introduced as well as the part-time degree course in Industrial Engineering. The additional specialisation in Industrial Relations now available to students in the Faculty of Commerce makes it possible for them to major in either Accountancy, Economics, Applied Psychology, Statistics or Industrial Relations. The Accountancy specialisation was also introduced at Newcastle University College. In the field of post-graduate work the introduction of courses leading to the degree of Master of Technology provides something of an innovation in British Universities. For the award of this degree students are required to complete a course of advanced systematic
study and are also required to present a thesis on an applied project. Conditions governing the award of the degree of Master of Commerce were also approved during the year.

The University’s policy of providing special and graduate courses designed to bring the latest developments in scientific and technological fields before technical personnel in industry was continued and during the year 783 students were enrolled in 34 of these courses. Once again many research projects were undertaken on behalf of industrial and Government organisations.

Work on a number of important buildings at Kensington was completed during the year, thus allowing more of the University’s activities to be concentrated on the main site. The three-storey Faculty of Science building has to some extent relieved the accommodation problems of the School of Chemistry at Broadway. The Library has also been transferred to this building. Certain sections of the Schools of Mechanical and Electrical Engineering are now located at Kensington in the project buildings on the High Street side of the site. The completion of the monocrete building for the School of Wool Technology has enabled this School to transfer from its cramped quarters in the East Sydney Technical College.

The 1958 Graduation Ceremony was held at Kensington on the 19th April, and degrees were conferred by the Deputy Chancellor on 188 students including 25 candidates for higher degrees. The honorary degree of Doctor of Science was conferred on Cobden Parkes Esq., N.S.W. Government Architect.

The Newcastle University College has continued to expand the range of its activities and Council has made provision for the appointment of Associate Professors in Science, Engineering, Technology and Arts. The growth of the College has also led to a reorganisation of its administrative arrangements. At the Graduation Ceremony held at the College on 21st March, 1958, degrees were conferred by the Chancellor on 31 students. The Chancellor of the University of New England also admitted 20 students of the College to the degree of Bachelor of Arts of his University. The number of registered students at Newcastle in 1958 is 786, including 217 in Arts.

The Council

At the meeting of the Council held on 8th July, 1957, Mr. Wallace C. Wurth, C.M.G., LL.B., was re-elected Chancellor of the University for the ensuing term of two years.

On 23rd July, 1957, the University suffered a sad loss in the death of one of its senior Councillors, Dr. W. E. Clegg. Dr. Clegg had been associated with the University from its earliest days, having been a
member of the Developmental Council from August, 1947, and a member of the University Council from its inception in 1949. At the November meeting, Council recorded its appreciation of Dr. Clegg’s services to the University over the years both as a member of Council and of the Executive Committee, and of the Buildings and Equipment Committee, of which he had been Chairman. To fill the casual vacancy caused by the death of Dr. Clegg, Mr. D. L. McLarty, O.B.E., M.I.E. Aust., M.I.E.S. (Scotland), M.N.E.C.Inst., Consulting Engineer, was appointed to Council on 30th October, 1957.

Mr. L. S. Baker, a graduate representative since his appointment on 1st July, 1955, tendered his resignation from Council on 27th October, 1957. Mr. Baker had recently accepted a position as maintenance engineer at the Burrinjuck Dam which made it impossible for him to attend future meetings of Council. The vacancy on Council caused by Mr. Baker’s resignation was filled with the appointment of Mr. R. A. Corin, B.E., Group Engineer, Postmaster General’s Department, on 12th February, 1958.

Council is pleased to record that two of its members, Dr. J. K. MacDougall and Mr. F. M. Mathews, were awarded Honorary Fellowships of the Sydney Technical College at the Diploma Presentation Ceremony held by the College on 19th June, 1958.

At the March meeting of Council, the Chancellor was granted leave of absence for the period of his visit overseas. The Chancellor, who sailed on 5th April, 1958, is visiting the United States of America with the Premier of New South Wales, the Hon. J. J. Cahill, M.L.A. During his stay in America, Mr. Wurth is taking the opportunity of enquiring into the latest developments in medical education in that country and into other matters of interest to the University.

Advisory Panels

At its meeting on 11th November, 1957, the Council reviewed the membership of the University’s Advisory Panels. Appointments and re-appointments were made effective to 31st December, 1959.

Owing to the rapid expansion of the University’s activities, Council at its May meeting decided to reorganise the Chemistry and Chemical Engineering Advisory Panel and the Commerce Advisory Panel. The activities of the Chemistry and Chemical Engineering Advisory Panel have been divided among three new panels, viz. Chemistry, Biological Sciences, Chemical Engineering and Food Technology. The new Advisory Panels for Economics, Accountancy and Business and Public Administration replace the Commerce Panel.
Meetings of the University's Advisory Panels were held on the dates shown hereunder:

Chemistry and Chemical Engineering Advisory Panel—22nd August, 1957.
Chemical Engineering and Food Technology Advisory Panel—22nd April, 1958.
Civil Engineering Advisory Panel—10th October, 1957; 12th June, 1958.
Hospital Administration Advisory Panel—1st October, 1957.
Humanities Advisory Panel—24th June, 1958.
Mining Engineering Advisory Panel—7th November, 1957.
Production Engineering Advisory Panel—24th September, 1957.

Enrolments
Details of enrolments for 1958 are shown hereunder:

Day Degree Courses

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<tr>
<th>Course</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>4th Year</th>
<th>5th Year</th>
<th>6th Year</th>
<th>Total</th>
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<td>Applied Chemistry</td>
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<td>10</td>
<td>11</td>
<td>4</td>
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<td>Applied Geology</td>
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<td>Applied Physics</td>
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<td>Architecture</td>
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<td>19</td>
<td>20</td>
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<td>Chemical Engineering</td>
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<td>18</td>
<td>19</td>
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<td>Civil Engineering</td>
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<td>33</td>
<td>21</td>
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<td>Commerce</td>
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<td>Electrical Engineering</td>
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<td>37</td>
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<td>Food Technology</td>
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<td>Industrial Engineering</td>
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<td>Industrial Arts</td>
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<td>Mechanical Engineering</td>
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<td>Metallurgy</td>
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<td>Science</td>
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<td>Surveying</td>
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<tr>
<td>Textile Technology</td>
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<tr>
<td>Wool Technology</td>
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</tbody>
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| Total                       | 539      | 319      | 168      | 125      | 10       | 3        | 1,164 |

541
### Conversion Courses

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<th>Course</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>4th Year</th>
<th>5th Year</th>
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<th>7th Year</th>
<th>8th Year</th>
<th>Miscellaneous</th>
<th>Total</th>
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* **Part-time Degree and Diploma Courses**

* Diplomas Course only.

† These Courses lead to a degree and do not qualify for the Diploma of Associateship of Sydney Technical College.
Higher Degree Courses

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<td>Doctor of Philosophy</td>
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<td><strong>Total</strong></td>
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Arts Courses (Newcastle University College)

Two hundred and seventeen students are enrolled in the Arts courses conducted by the Newcastle University College for the degree of Bachelor of Arts of the University of New England. Five candidates are working for the degree of Master of Arts.

Graduate and Special Courses

Enrolments in the graduate and special courses conducted by the various Schools of the University and the Institute of Nuclear Engineering totalled 783. The graduate and special courses given during the year are listed on pages 553 and 554 of this report.

Scholarships, Bursaries and Fellowships

Council gratefully acknowledges the following Scholarships, Bursaries and Fellowships which have been made available during the year:

- One Arnott Scholarship in Food Technology.
- One Atmospheric Pollution Research Fellowship.
- Three Australian Atomic Energy Commission Undergraduate Scholarships.
- Two Australian Coal Association (Research) Ltd. Scholarships.
- One Australian Cream Tartar—Chrome Chemicals Joint Scholarship.
- One Bond's Industries Scholarship in Textile Technology.
- Two Davies Coop Scholarships in Textile Technology.
- One Ellists (D.H.A. Rural Division) Scholarship in Wool Technology.
Two Felt and Textiles of Australia Ltd. Scholarships in Textile Technology.

Two General Motors-Holden’s Post-Graduate Research Fellowships.

One Hoover Scholarship in Electrical Engineering.

One Imperial Chemical Industries of Australia and New Zealand Research Fellowship.

One John Vicars and Co. Ltd. Scholarship in Textile Technology.

Three Joint Coal Board Scholarships.

One Mauri Bros. and Thomson Ltd. Scholarship in Food Technology.

Six Mining and Metallurgical Bursaries Fund Scholarships.

One Nock and Kirby Scholarship in Accountancy.

One W. D. Scott and Co. Scholarship in Textile Technology.

One Swiss Textile Machine Industries Scholarship in Textile Technology.

Two Water Research Foundation of Australia Ltd. Fellowships.

One Weston Organisation Scholarship in Food Technology.

One William Cooper and Nephews Scholarship in Wool Technology.

Six Public Bursaries.

Eight Public Exhibitions.

Six hundred and thirty-nine Commonwealth Scholarships.

Two hundred and five Teachers’ College Scholarships.

Particulars of these awards are given in Appendix III.

**Committee on Australian Universities**

The Committee on Australian universities was appointed by the Prime Minister, the Right Honourable R. G. Menzies, early in 1957, under the Chairmanship of Sir Keith Murray (Chairman of the University Grants Committee of Great Britain). Its terms of reference were “to indicate ways in which the universities might be organised so as to ensure that their long term pattern of development is in the best interests of the nation, and in particular to enquire into such matters as—

1. the role of the university in the Australian community;
2. the extension and co-ordination of university facilities;
3. technological education at university level; and
4. the financial needs of universities and appropriate means of providing for these needs.”

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The Committee, in carrying out its enquiries visited the University on 15th and 16th July, 1957, and on 18th July, inspected the College at Newcastle. A report was submitted to the Committee setting out the developmental needs of the University and stressing, in particular, such special features of this institution as the provision of part-time science and engineering degree courses, the development of research facilities and course in specialised technologies, and its state-wide teaching responsibilities.

**Murray Report**

The Committee presented its report to the Commonwealth Government at the end of September, 1957, and its main points, in so far as they affect this University, are summarised as follows:

The Committee found that in general the Australian universities were inadequately staffed and equipped to provide the best possible training and educational environment even for their present students, and that the situation was likely to become more serious with the increased numbers of students anticipated in the near future. In the Committee’s view under-financing of the universities has led to lack of sufficient accommodation, particularly for first year students, in lecture rooms, laboratories and libraries and the lack of sufficient staff, equipment and materials has handicapped teaching and research programmes.

In dealing with scientific and technological education the Committee stated that “provision for the sciences and particularly the technologies presents one of the most urgent problems facing the Australian universities”. The report recommended that in view of the high cost of scientific and technological research the universities should co-operate with each other in the establishing of expensive scientific departments in which few students are likely to enrol. In regard to research work connected with fields such as nuclear engineering, it suggested that the universities might make arrangements with the Australian Atomic Energy Commission for the use of such of its equipment as is beyond the means of the universities to purchase. In this connection the Committee commended the proposed establishment by the Australian Atomic Energy Commission and the universities of the Australian Institute of Nuclear Science and Engineering.

The report offered some criticisms of the universities particularly in connection with high failure rates and the generally inadequate provisions made for honours schools and postgraduate work. The Committee also felt, that, in some universities at least, improved administrative machinery could hasten the transaction of academic business and create closer links between the academic and governing bodies.
Of particular interest to our university was the proposal that the functions of the New South Wales University of Technology be widened to include arts and medical studies, and that its name be changed to "The University of New South Wales". In March the University Council welcomed this proposal and pointed out that its implementation would enable the University to broaden the scope of its activities, while retaining the essentially scientific and technological conception for which it was created.

One of the most far reaching of the Committee's recommendations was the proposal that an Australian University Grants Committee be established to advise the Commonwealth Government on the financial requirements of the universities. The Committee felt that it would be three years before such a body would be sufficiently acquainted with the specific problems of each university to make recommendations on their behalves. To bridge this three year gap the Committee presented its own interim financial recommendations designed to meet, at least in part, capital and recurrent needs for the years 1958, 1959 and 1960.

The recommendations provided for capital expenditure in relation to specified building projects and the equipping of these buildings, increased running expenses, increased salaries, and a special emergency grant to help remedy accumulated deficiencies in the universities which the Committee considered to exist. In framing its recommendations in respect of grants to assist with both capital and revenue expenses, the Committee considered that the Commonwealth grants should be matched by specified minimum State grants to the universities for these purposes.

Ceremony of Conferring of Degrees held at Kensington, 19th April, 1958

The seventh Graduation Ceremony was held in the grounds at Kensington on 19th April, when the Deputy Chancellor admitted 188 candidates to their degrees. Eight candidates were admitted to the degree of Doctor of Philosophy, fifteen to the degree of Master of Science, and two to the degree of Master of Engineering. From the Faculties of Science and Technology, seventy-seven students were awarded the degree of Bachelor of Science and four the degree of Bachelor of Science (Optometrical Science). Seventy-three candidates were admitted to the degree of Bachelor of Engineering, two to the degree of Bachelor of Engineering (Geology), and seven to the degree of Bachelor of Architecture.

The Ceremony was attended by the Acting Premier and Minister for Education, the Honourable R. J. Heffron, M.L.A. Sir Richard Boyer, K.B.E., M.A., Chairman of the Australian Broadcasting Commission, delivered the Occasional Address.

A list of recipients of degrees awarded at the Ceremony is given in Appendix IV.

Conferring of Honorary Degree on the Right Honourable R. G. Menzies

At a Ceremony held on 21st October, 1957, the Chancellor admitted the Right Honourable R. G. Menzies, C.H., Q.C., LLM., Hon. LL.D., M.P., Prime Minister of Australia, to the Degree of Doctor of Science Honoris Causa. A distinguished congregation included representatives of the State and Commonwealth Parliaments, the Universities of Sydney and New England, the churches, the armed forces, and professional, commercial and industrial organisations of New South Wales. After receiving his degree from the hands of the Chancellor, Dr. Menzies in a graceful address warned of the dangers of over-specialisation in university education and pointed to the necessity for the common pursuit of scientific and humane studies.

Senior Staff

Council granted leave of absence for six weeks to the Vice-Chancellor to attend a meeting of the General Conference of the International Atomic Energy Agency held in Vienna during October, 1957, as a member of the Australian delegation.

At its March Meeting, Professor M. Chaikin was granted leave of absence for a period of six months from March, 1958, for the purpose of contacting overseas industrial organisations, research establishments and University textile schools.

In May, 1958, Council approved the appointment of the following professors as Deans:—

Professor C. J. Milner—Dean of the Faculty of Science.
Professor R. H. Myers—Dean of the Faculty of Technology.
Professor A. H. Willis—Dean of the Faculty of Engineering.
Professor F. E. A. Towndrow—Dean of the Faculty of Architecture.
Professor D. C. Rowan—Dean of the Faculty of Commerce.
Professor J. J. Auchmuty—Dean of the Faculty of Humanities and Social Sciences.
Appointments to the Professorial Staff during the year under review were as follows:

*Associate Professor of Chemical Engineering:*

*Associate Professor of Philosophy:*

*Associate Professor of Architecture:*

*Associate Professor of Industrial Arts:*

*Professor of Sociology:*

*Associate Professor of Electrical Engineering:*

*Associate Professor of Physics:*

*Associate Professor of Physics:*

Other appointments and promotions to senior staff during the period under review were:

*Senior Lecturer in Civil Engineering:*

*Senior Lecturer in Chemistry:*

*Senior Lecturer in Metallurgy (Newcastle University College):*
Senior Lecturer in Accountancy:

Senior Lecturer in English:

Senior Lecturer in Textile Technology:

Senior Lecturer in Textile Technology:

Assistant Bursar (Buildings and Grounds):

Senior Lecturer in Electrical Engineering:

Senior Lecturer in Applied Psychology:

Senior Lecturer in Traffic Engineering:

Senior Lecturer in Architecture and Building:

Senior Lecturer in Biological Sciences:

Senior Lecturer in Accountancy:

Senior Lecturer in Chemistry:

Senior Lecturer in Geography (Newcastle University College):

Senior Lecturer in Mechanical Engineering:
Senior Lecturer in Chemistry:

Senior Lecturer in Mining Engineering and Applied Geology:

Retirements and resignations for the period were as follows:—
O. Spindler, Senior Lecturer in German, Newcastle University College; retired 19th September, 1957.
J. B. Forster, Senior Lecturer in Metallurgy; retired 31st December, 1957.
G. H. Godfrey, Associate Professor of Physics; retired 31st December, 1957.
R. E. Pert, Assistant Registrar; resigned 31st July, 1957.
R. J. Irving, Senior Lecturer in Chemistry; resigned 8th November, 1957.

Deaths of the following members of staff are regretfully recorded:—
H. Brock, Lecturer in Mechanical Engineering; deceased 1st August, 1957.
P. Beckman, Senior Lecturer in Chemistry, Wollongong; deceased 3rd February, 1958.
L. W. Girdler, Lecturer in Mechanical Engineering; deceased 18th May, 1958.

During the year under review, study leave was approved for the following members of staff for the periods indicated:—
C. St. J. Lamb, Lecturer in Electrical Engineering—one year from December, 1957.
G. W. K. Cavill, Senior Lecturer in Chemistry—one year from December, 1957.
G. J. Parker, Senior Lecturer in Electrical Engineering—one year from December, 1957.
F. Pollard, Lecturer in Applied Physics—one year from December, 1957.
M. Chaikin, Professor of Textile Technology—six months from April, 1958.
E. L. Mortimer, Senior Lecturer in Electrical Engineering—one year from May, 1958.
H. Selinger, Lecturer in Production Engineering—one year from August, 1958.
P. K. Elkin, Senior Lecturer in English—one year from August, 1958.

J. N. Hool, Senior Lecturer in Mechanical Engineering—one year from August, 1958.

J. Hirschhorn, Senior Lecturer in Mechanical Engineering—one year from September, 1958.

E. S. Swinbourne, Lecturer in Chemistry—one year from November, 1958.

R. G. Burdon, Senior Lecturer in Mining Engineering and Applied Geology—one year from November, 1958.

L. E. Koch, Senior Lecturer in Mining Engineering and Applied Geology—one year from December, 1958.

J. L. Courtney, Senior Lecturer in Chemistry—one year from December, 1958.

G. L. Macauley, Registrar—nine months from February, 1959.

A. S. Ritchie, Supervising Lecturer in Mining Engineering and Applied Geology (Newcastle University College)—one year from August, 1959.

C. M. Sapsford, Lecturer in Mechanical Engineering—twelve months during 1959.

R. O. Phillips, Senior Lecturer in Architecture—twelve months during 1959.

R. T. Martin, Senior Lecturer in Applied Psychology—twelve months during 1959.

Other members of staff on study leave during the year whose leave was approved at an earlier period were:—

N. Runcie, Lecturer in Economics.
L. G. Parry, Senior Lecturer in Applied Physics.
J. R. A. Anderson, Senior Lecturer in Chemistry.
E. R. Cole, Senior Lecturer in Chemistry.
S. E. Livingstone, Senior Lecturer in Chemistry.
L. W. O. Martin, Senior Lecturer in Chemistry.
S. J. Angyal, Associate Professor of Organic Chemistry.
E. R. McCartney, Senior Lecturer in Chemical Engineering.
H. A. Borchardt, Lecturer in Mechanical Engineering.
J. R. Allen, Lecturer in Mechanical Engineering.
J. F. D. Wood, Associate Professor of Mechanical Engineering.
K. K. Watson, Lecturer in Civil Engineering.
L. J. Lawrence, Senior Lecturer in Applied Geology.
D. W. Phillips, Pro-Vice-Chancellor and Professor of Mining Engineering.
A. M. Ginges, Lecturer in English.
N. B. Nairn, Senior Lecturer in History.
A. Keane, Senior Lecturer in Mathematics.
R. G. Sutton, Lecturer in Architecture.
N. J. Anderson, Senior Lecturer in Architecture.

Courses of Study

During the year the University extended the range of courses offered at both undergraduate and graduate levels. A four year course in Industrial Arts, leading to the degree of Bachelor of Science was introduced in 1958, to provide training to degree level for teachers of Manual Arts in the secondary schools. Council, in November, approved the introduction of a seven-year part-time degree course in Industrial Engineering. This course is the equivalent of the four-year full-time course first offered in 1957.

At the March meeting, Council approved the introduction of a further specialisation, Industrial Relations, for students at Sydney studying for the degree of Bachelor of Commerce. The Accountancy specialisation was introduced at the Newcastle University College in 1958, and commerce students at the College may now major in Economics or Accountancy. A further development in the Commerce courses confirmed by Council in March is an arrangement made with the University of Sydney, whereby students taking geography as an optional subject in the Commerce course receive their lectures at that University. In view of the rapid development of the Faculty of Commerce, Council in May, approved the creation of Associate Professorships in Accountancy and Economics and it is expected that appointments to these positions will be made shortly.

In November the Council approved the introduction of two additional higher degrees, Master of Commerce and Master of Technology. The latter degree is something of an innovation in British universities though its counterpart is well established in other places. The general conditions governing the award require the completion of a systematic advanced course of formal study as well as the submission of a thesis on an applied topic. The institution of the degree springs from the recognition of the considerable advance of knowledge in the fields of science and technology which has marked recent years and the consequent increased scope for advanced formal instruction in these fields. Courses for the degree have been offered in 1958, in Concrete
Structures, Traffic Engineering, and Highway Engineering. It is expected that the availability of the degree will increase the number of graduates who continue to study systematically in their chosen field of specialisation.

At the September meeting, Council gave its approval to major revisions to the courses in Architecture, Building, and Quantity Surveying. The principal change effected provides for a common full-time first year for the degree and diploma courses given by the Faculty of Architecture. The incorporation of a proportion of full-time study into the diploma courses is in accordance with the policy of the Royal Institute of British Architects to encourage some full-time study in courses to which its professional recognition is given.

The full-time Food Technology course was also revised during the year to bring it into line with revisions made to the Chemical Engineering course as set out in Council's last Report.

This year the programme of special and graduate courses was extended and 26 courses were given by the various Schools of the University and eight by the Institute of Nuclear Engineering. Details of courses offered by the Institute are given later in this Report. A total of 647 students enrolled in the following 26 courses offered by the Schools:

School of Applied Physics:
Advances in Physics and their significance to Metallurgy.
(Newcastle University College.)

School of Applied Psychology (in conjunction with the Department of Food Technology):
The Assessment of Taste.

School of Chemical Engineering:
Post-graduate Course in Paint Technology.
Extension Course in Paint Technology (1957).
Extension Course in Ceramic Technology.
Instrumentation in the Modern Food Plant.
Winter School on Canning.
Costs in the Australian Chemical Process Industries.
Coal Utilisation in Australia—Techniques and Economics.

School of Chemistry:
Applied Spectroscopy.
Electronic Instrumentation for Chemists.
School of Civil Engineering:
  Advanced Hydraulics.
  Principles of Hydrology.
  Hydrologic Design.
  Structural Analysis.
  Prestressed Concrete.
  Reinforced Concrete.

School of Electrical Engineering:
  Automatic Control.

School of Mechanical Engineering:
  Modern Developments in Mechanical Engineering.

School of Traffic Engineering:
  Traffic Planning and Control (1957).
  Fundamentals of Traffic Engineering (held at Kempsey, N.S.W.).

School of Wool Technology:
  Short Course in Wool Technology (for officers of the Commonwealth Department of Primary Industry).
  Special Lectures in Wool Commerce (for members of the Wool Industry).
  Sheep and Wool Improvement School.

The Institute of Nuclear Engineering

The Institute of Nuclear Engineering has continued to play a prominent part in the activities of the University, particularly at the advanced levels of graduate instruction and basic research.

During the year the Institute presented the following six graduate courses:
  Isotopes and their Applications.
  Laboratory Course in Isotope Techniques (two courses).
  An Advanced Course in Reactor Theory.
  One Year Course in Nuclear Engineering.
  Programming for the High Speed Digital Computer (two courses).

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The course in “Isotopes and their Applications” was partly designed to meet the needs of science teachers in the secondary schools, who are now required to give instruction in the elements of nuclear physics and radioactivity, and twenty free places in the course were made available to teachers.

The total enrolment in the Institute’s courses numbered 136.

The Institute has continued its policy of sponsoring research projects in the Schools of the University and a number of these are briefly described later in this report in the section dealing with Research.

**Australian Institute of Nuclear Science and Engineering**

In June, 1957, following upon preliminary discussions held in December, 1955, a meeting of representatives of all the Australian Universities and the Australian Atomic Energy Commission was held at which it was agreed that an “Australian Institute of Nuclear Science and Engineering” should be formed as a joint organisation of the Commission and the universities. It is proposed that the Institute will be governed by a Council comprising one representative from each of the member universities and four representatives from the Commission.

At its September meeting, Council gave its approval to the University becoming a member of this Institute and contributing £2,000 annually towards its administrative expenses.

The Headquarters of the Institute will be situated at Lucas Heights and its principal objects will be to arrange for the training of scientific research workers and to carry out research and investigations in fields associated with uranium or atomic energy. Facilities will be provided there for staff and students of each of the member universities to work with radio-active materials. The draft rules for operation of the Institute will be submitted for the approval of Council at the forthcoming July meeting.

**Research**

Many long term research projects are being maintained and activities range from fundamental research to subjects of immediate effect in our daily lives, such as studies being conducted by the School of Traffic Engineering. In many cases research is being carried out in co-operation with outside bodies.

Within the University a considerable programme of research has been sponsored by the Institute of Nuclear Engineering. In the Radio Chemical Laboratory radioactively labelled atoms are being used to trace the exchange of atoms between different compounds of
the same element. Some changes in the chemical behaviour of atoms occur in millionths of a second, and electronic systems capable of measuring time-intervals of one thousand millionth of a second are being designed to widen the scope of study.

In the School of Metallurgy, a fundamental study is being made of the mechanism of oxidation of certain metals, as well as into the extraction, purification and welding of some of the newer metals.

A considerable amount of equipment has been installed in the Paint Technology, Industrial Ceramics and the Plastics and Rubber Laboratories. Research connected with the development of refractory ceramic-type fuel elements for nuclear reactors is being carried out in conjunction with the Australian Atomic Energy Commission. In conjunction with the Department of Mines, the Schools of Chemical Engineering and Mining Engineering and Applied Geology are surveying the clay resources of New South Wales to establish the quantities of clays available and their suitability for ceramic purposes.

The 500 curie Cobalt-60 source of the School of Chemical Engineering has been used for tests made by the Commonwealth Scientific Industrial Research Organisation and the Australian Atomic Energy Commission and for experiments in the preservation of foodstuffs, such as cereal products and dried fruits.

A new project involving research into the use of plastic adhesives for bonding fractured bones has been initiated in the same School and the early work completed holds considerable promise.

Several major projects are being undertaken by the School of Civil Engineering in conjunction with the Water Research Foundation of Australia Ltd., of which plastic lining for dams, construction of small dams, and the use of green algae as a method of sewage treatment, are worthy of special mention.

In the School of Electrical Engineering, research is being carried out into developing further the Analogue Computer and, in connection with UTECOM, the University's digital computer, developing “memories” and semi-automatic procedures in programming.

A Nuclear Reactor Simulator has been constructed in which operation of the controls on the panel produces indications which are identical with those that would be shown on the instruments of HIFAR at the Atomic Energy Commission's establishment at Lucas Heights.

An increasing number of research and development problems encountered in industry have been investigated by the various Schools at the request of industrial organisations and government departments.
Research undertaken by candidates for higher degrees naturally forms an important part of the overall programme, and this year, 251 candidates are working for the degree of Master or Doctor. This is an increase of 37 on last year's figure. A list of research projects is set out in Appendix V of this Report.

**Academic Administration of the University**

Consideration has been given to the academic administration of the University with a view to increasing the effectiveness of the several faculties and the Professorial Board. These considerations arose chiefly from the difficulties consequent upon the increased membership of these bodies caused by the growth in the academic staff in recent years. Accordingly, the Vice-Chancellor presented a number of proposals to the Council for the re-organization of the academic administration of the University. These involved an amendment to Section I of Chapter III of the By-laws of the University limiting membership of the Professorial Board to full professors and such other persons as the Council may appoint.

No changes were envisaged in the powers and functions of the Faculties, but the Vice-Chancellor proposed that the Deans be assigned specific executive powers in relation to certain Faculty matters, on which they may make recommendations directly to the Vice-Chancellor or the Professorial Board. It was further proposed that a standing committee of each Faculty be appointed to assist the Dean in the discharge of his duties.

The proposals were considered by Council at its May meeting and approval was given to their implementation.

**Symposium on Transport, Traffic and Science**

The fourth of the University's series of annual Symposia was held on 22nd and 23rd October, 1957, when papers were read on the subject of "Transport, Traffic and Science". The Symposium was officially opened by the Premier, the Hon. J. J. Cahill, M.L.A., in the presence of some 250 guests from several states of the Commonwealth.

Papers were contributed by Mr. W. C. Wentworth, M.H.R.; Mr. H. M. Sherrard, N.S.W. Commissioner for Main Roads; Mr. F. J. Hannaberry, Commissioner, Commonwealth Department of Railways; Mr. J. M. Bayley, Traffic Engineer, Melbourne; Professor D. Winston, Professor of Town and Country Planning, University of Sydney; Dr. L. Ross, Secretary, N.S.W. Branch, Australian Railways Union; Mr. A. A. Shoebridge, N.S.W. Commissioner for Government Transport; Mr. H. E. Richards, General Secretary, National Roads and Motorists'
Association; Dr. H. F. Bell, Economist, A.M.P. Society; and from this University, Professors W. R. Blunden and D. F. Orchard, and Mr. H. Kolsen.

The speakers dealt with many of the problems created by Australian transport and traffic conditions and indicated a number of directions in which their solution might be found by detailed scientific investigation.

The papers delivered at the Symposium have been published by the University in a book entitled, "Transport, Traffic and Science".

Development of the Kensington Site

The completion during the year of a number of important buildings at Kensington has made it possible to locate more of the University's activities on the main site. The two storey monoccrete building at High Street now accommodates the School of Wool Technology (previously located at the East Sydney Technical College), the Schools of Traffic Engineering and Hospital Administration, and the new Department of Industrial Arts. This building was officially opened by the Acting Premier, the Hon. R. J. Heffron, M.L.A., on 29th May, 1958.

Work on the research project buildings for the Schools of Electrical and Mechanical Engineering was completed early in 1958. The Electrical Engineering building houses those sections of the School which deal with control engineering, high voltage, and analogue computing. In the Mechanical Engineering building, laboratories have been established for the study of fluid mechanics, automatic control, refrigeration, air conditioning, ventilation and solar energy.

A three storey building, the first of a group of buildings to be erected on the main site for the Faculty of Science, was completed early in 1958, and now houses teaching and research laboratories for later year students in Analytical Chemistry together with the Kensington Library.

At the end of 1957, a large monoccrete lecture hall was completed on the western side of Anzac Parade. This has helped in part to relieve the accommodation problem brought about by increased enrolments especially in Commerce courses.

In August, 1957, work began on the Student Residential College at Kensington. Council is pleased to report progress has been rapid and it is expected the college will be completed in time for the commencement of the first term in 1959. The college has been designed to accommodate 192 students as well as a number of tutors and other staff and will provide liberal recreational facilities for students.
Fire in the Main University Building at Kensington

On the morning of Saturday, 5th October, 1957, a serious fire broke out on the second floor of the Main Building at Kensington. The fire destroyed the greater part of the J. I. Carroll Research Laboratory of the School of Applied Physics on that floor and caused extensive damage to Architecture classrooms on the floor above. Apart from the damage to the building and the destruction of some very valuable equipment, one tragic feature of the fire was the loss of the results of research work carried out over past years by members of the School of Applied Physics. The actual cause of the fire was not discovered. At the November meeting Council recorded its appreciation of the voluntary and generous help given by members of staff in adjusting to the calamity, and noted that as a result of these efforts not a single class was cancelled.

The burnt-out section on the second floor has been re-planned with a view to providing the School of Applied Physics with a larger area of effective space than it possessed before the fire, and work is now proceeding on the reconstruction which should be completed by October of this year. The damaged lecture-rooms on the Architecture floor were back in use by the start of the 1958 Session.

Committee on Failure and Wastage Rates

One of the matters to which attention was drawn in the Murray Report was the high student failure and wastage rates found in Australian universities. This is a problem which has concerned the University for some time and at the March meeting Council approved a recommendation by the Vice-Chancellor that a Committee be established to investigate this matter.

The Committee which is under the Chairmanship of the Vice-Chancellor is being assisted in its work by two senior officers engaged full-time on the investigation of failure and wastage rates among our students. Preliminary surveys are being conducted into the academic and personal backgrounds of students who enrolled at the beginning of 1958, and who have since abandoned their studies.

The work of the committee is expected to extend over two years and Council hopes that its results will provide a means whereby failure and wastage rates can be reduced.

Student Organisations and Activities

Student organisations have continued to function as an important part of the extra-curricular life of undergraduates in the University.
The participation of students in these activities has encouraged the growth of existing societies and the formation of new ones to cater for the different interest of the student body.

Teams representing the University in nine sports travelled to various capital cities in May, 1958, to take part in the Inter-Varsity competition. Victories were recorded by the men's judo and single sculls representatives while the rifle shooting and basketball teams were creditably placed in the finals of their events.

Notable among the activities of the Drama Club during the year was the first Australian production in March, 1958, of the gay French comedy by Jean Anouilh, "Thieves' Carnival", which was given four performances. The psychological drama by Aldous Huxley, "The Gioconda Smile" was also presented on several occasions, and at the end of the year two one-act plays were performed by a "workshop" group of the club.

Since its formation early in 1957, the University of Technology Arts Society has been active in arranging a variety of programmes including recorded recitals of music and drama, and addresses by guest speakers on a wide range of subjects.

The activities of the religious societies within the University during the year included a seminar on "Freedom" held by the Newman Society, and a series of addresses dealing with "Worl Problems and Christianity", sponsored by the Student Christian Movement.

Further editions of the Engineering Yearbook, the Science Yearbook, and the Metallurgical Review and nine issues of the students' newspaper "Tharunka" were published during the year.

Course in Study and Reading Techniques

In a report submitted to Council by the Professorial Board it was pointed out that two factors possibly contributing to the high failure rates among university students were poor study habits and faulty reading techniques.

As a step towards correcting these faults, Council at its March meeting gave its approval to the provision of a course in study and reading techniques by the staff of the Vocational Guidance Office. Two pilot investigations have been undertaken with small groups of students and results so far indicate that these courses might be developed on a scale where they can contribute towards reducing failure rates in the University.
Development at Broken Hill

During the year discussions were held between the Vice-Chancellor and the Broken Hill Mining Managers' Association and the Broken Hill Technical Education Advisory Council with a view to reorienting the courses offered at Broken Hill towards a more effective servicing of local needs. This approach had led to the development of some special courses which will operate only in Broken Hill. These courses are based on the related diploma courses but provide for the inclusion of subjects for which there will be little or no demand outside of Broken Hill. Owing to the distinctive nature of the courses it has been agreed that the awards should be different from existing awards and it has therefore been proposed to designate the University centre at Broken Hill, "The Broken Hill School of Mines of the New South Wales University of Technology", while the award to be made on the completion of the new courses will be "Associate of the Broken Hill School of Mines". Three courses are proposed to commence in 1959, Metalliferous Mining Engineering, Mechanical Engineering and Minerals Technology.

Newcastle University College

At the graduation ceremony held at the Newcastle University College on 21st March, 1958, degrees were conferred by the Chancellor on thirty-one students of the College. One candidate was admitted to the degree of Doctor of Philosophy and one to the degree of Master of Science; twenty-one students graduated with the degree of Bachelor of Science and eight with the degree of Bachelor of Engineering. The Chancellor of the University of New England, the Rt. Hon. Sir Earle Page, admitted twenty students of the College to the degree of Bachelor of Arts of the University of New England.

The academic staff of the Newcastle University College now numbers seventy-eight, and in May, Council decided to make provision for the appointment of Associate Professors in Science, Engineering, Technology and Arts; applications have been called for these positions. At the same time it was recognised that the growth of the College required a reorganisation of the administrative arrangements and as a consequence Professor J. J. Auchmuty was appointed full-time Deputy Warden and the position of Registrar, together with six other administrative positions, were established. Appointment to these posts should be made by the end of July.

The response to the Economics course leading to the degree of Bachelor of Commerce, first provided at Newcastle in 1957, has encouraged Council to introduce the Accountancy specialisation leading to the award of this degree, and classes were given from the first term of 1958.
Five students are enrolled at the College as candidates for the degree of Master of Arts of the University of New England.

The total number of registered students at Newcastle in 1958 is 786, compared with 694 in 1957. Details of enrolments are set out hereunder. These figures are included in the general enrolment tables of the University shown on pages 541 and 542.

*Faculties of Science, Engineering, Technology, Commerce and Architecture*

**Day Degree Courses:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Students</th>
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<tr>
<td>Applied Chemistry</td>
<td>5</td>
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<tr>
<td>Chemical Engineering</td>
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</tr>
<tr>
<td>Civil Engineering</td>
<td>15</td>
</tr>
<tr>
<td>Commerce</td>
<td>15</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>5</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>22</td>
</tr>
<tr>
<td>Metallurgy</td>
<td>8</td>
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<tr>
<td>Science</td>
<td>33</td>
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Total: 113

**Part-time Degree and Diploma Courses:**

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<td>Applied Geology</td>
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<tr>
<td>Architecture</td>
<td>30</td>
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<tr>
<td>Chemical Engineering</td>
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<td>Civil Engineering</td>
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<tr>
<td>Commerce</td>
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<tr>
<td>Electrical Engineering</td>
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<tr>
<td>Industrial Chemistry</td>
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<tr>
<td>Manual Arts</td>
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<tr>
<td>Mechanical Engineering</td>
<td>77</td>
</tr>
<tr>
<td>Metallurgy</td>
<td>55</td>
</tr>
<tr>
<td>Science</td>
<td>8</td>
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<tr>
<td>Miscellaneous Subjects</td>
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Total: 397

**Conversion Courses:**

<table>
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<td>Chemical Engineering</td>
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<tr>
<td>Electrical Engineering</td>
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<td>Mechanical Engineering</td>
<td>10</td>
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<tr>
<td>Metallurgy</td>
<td>8</td>
</tr>
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Total: 33

562
Higher Degrees:

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<th>Degree</th>
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<tbody>
<tr>
<td>Master of Science</td>
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<tr>
<td>Master of Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>7</td>
</tr>
<tr>
<td>Totals</td>
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</table>

Faculty of Humanities and Social Sciences

Arts Courses:

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<th>Course</th>
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<tbody>
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<tr>
<td>Master of Arts</td>
<td>5</td>
</tr>
<tr>
<td>Totals</td>
<td>222</td>
</tr>
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</table>

Benefactions

Council acknowledges with gratitude the following benefactions, which were received during the year:

Nuffield Foundation Research Grants—A further grant of £3,125 has been made by the Nuffield Foundation for the maintenance of the Nuffield Research Chair in Mechanical Engineering, bringing total grants in this connection to £21,875. The sum of £1,000 has also been donated for research in the School of Chemistry.

School of Civil Engineering Research Fund—The following donations have been received by the University for the School of Civil Engineering Research Fund:

<table>
<thead>
<tr>
<th>Donor</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Broken Hill Mining Managers’ Association</td>
<td>£75 12 0</td>
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<tr>
<td>Concrete Industries (Aust.) Pty. Ltd.</td>
<td>£5 5 0</td>
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Department of Optometry Research Fund—

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<td>E. Sullivan, Esq.</td>
<td>£2 0 0</td>
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<td>Pierwood Plastics Ltd.</td>
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<tr>
<td>K. M. Phillips, Esq.</td>
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<tr>
<td>G. R. T. Taylor, Esq.</td>
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</tr>
<tr>
<td>Chick Sexers Association of N.S.W.</td>
<td>£16 16 0</td>
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Water Research Foundation of Australia Ltd. Grant—A further grant of £300 was made by the Water Research Foundation of Australia Ltd. for research into the growth of green algae as a method of sewage treatment.
University Prize Fund—Donations for the University Prize Fund have been received during the year as follows:

<table>
<thead>
<tr>
<th>Name of Donor</th>
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<tr>
<td>Royal Australian Institute of Architects</td>
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<tr>
<td>The English Electric Co. Ltd.</td>
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<tr>
<td>D. G. Howles, Esq.</td>
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<tr>
<td>H. B. Gage, Esq.</td>
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<tr>
<td>R. E. Solly, Esq.</td>
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<tr>
<td>A. Verey, Esq.</td>
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<tr>
<td>J. W. Grinham, Esq.</td>
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<tr>
<td>G. G. Springthorpe, Esq.</td>
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<td>0</td>
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<tr>
<td>Australian Institute of Quantity Surveyors</td>
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<tr>
<td>Professor F. E. A. Towndrow</td>
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<td>Manual Arts Teachers' Association</td>
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<td>James Hardie and Co. Pty. Ltd.</td>
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<tr>
<td>Australian Institute of Builders</td>
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<tr>
<td>School of Architecture Jubilee Fund</td>
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<td>0</td>
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<tr>
<td>New South Wales University of Technology Accountancy Association</td>
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<td>Ford Motor Co. of Australia Pty. Ltd.</td>
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<tr>
<td>M. Swarts, Esq.</td>
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<tr>
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<td>E. S. Wolfenden &amp; Co.</td>
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<td>British Psychological Society (Australian Branch)</td>
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<tr>
<td>Larke Hoskins Industries Ltd.</td>
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<tr>
<td>Australian Institute of Quantity Surveyors</td>
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<tr>
<td>Fowell, Mansfield and Maclurcan</td>
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<td>Australian Optometrical Association (N.S.W. Division)</td>
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<td>Australian Optical Co. Pty. Ltd.</td>
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<tr>
<td>Arthur Cocks &amp; Co. Ltd.</td>
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<tr>
<td>Optical Products Pty. Ltd.</td>
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Australian Automobile Association Grant—The Australian Automobile Association has made available a further sum of £10,030, towards the maintenance of the Chair in Traffic Engineering.
Chemical Engineering Research Fellowship Fund—Donations have been received from the following organisations for a Research Fellowship in the School of Chemical Engineering:

<table>
<thead>
<tr>
<th>Organisation</th>
<th>£  s. d.</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Rylands Bros. (Australia) Pty. Ltd.</td>
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<tr>
<td>Commonwealth Steel Co. Ltd.</td>
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<td>Australian Iron and Steel Ltd.</td>
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<tr>
<td>Southern Portland Cement Ltd.</td>
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<tr>
<td>Electricity Commission of New South Wales</td>
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<tr>
<td>N.S.W. Government Railways</td>
<td>340 0 0</td>
</tr>
</tbody>
</table>

Beetle Elliott Ltd. Grant—A further donation of £500 was made available by Beetle Elliott Ltd. to the University’s Special Purposes Fund.

School of Metallurgy Research and Special Activities Fund—Donations have been received for the School of Metallurgy Research and Special Activities Fund as follows:

<table>
<thead>
<tr>
<th>Organisation</th>
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</thead>
<tbody>
<tr>
<td>Smelters Refiners Pty. Ltd.</td>
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<tr>
<td>Century Storage Battery Co. Ltd.</td>
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Donations towards Printing of “Wool Technology”—Donations totalling £65 15s. 0d. for the printing of “Wool Technology”, were made by the following organisations:

<table>
<thead>
<tr>
<th>Organisation</th>
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</thead>
<tbody>
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<td>Felt and Textiles of Australia Ltd.</td>
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<td>Riverina Stock Feeds Pty. Ltd.</td>
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<tr>
<td>Rural Bank of New South Wales</td>
<td>5 5 0</td>
</tr>
</tbody>
</table>

Sellers Fabrics Pty. Ltd. Research Grant—A donation of £100 was made available by Sellers Fabrics Pty. Ltd., for research in the School of Textile Technology.

The Commonwealth Industrial Gases Ltd. Grant—A grant of £250 has been received from the Commonwealth Industrial Gases Ltd., for research in the School of Mining Engineering and Applied Geology.

Blits Trading Co. Pty. Ltd. Grant—£50 was donated to the School of Mining Engineering and Applied Geology by Blits Trading Co. Pty. Ltd.
Social Science Research Council of Australia Grants—The Social Science Research Council of Australia has granted £150 for the study of Local Government in Australia, being carried out in the School of Humanities and Social Sciences.

Hunter Valley Research Foundation Grant—The sum of £500 has been donated by the Hunter Valley Research Foundation for investigations being carried out in Newcastle University College.

Bradford Cotton Mills Ltd. Grant—A sum of £78 was provided by Bradford Cotton Mills Ltd. for the purchase of a Marconi pH meter for the School of Textile Technology.

Atlantic Union Oil Co. Pty. Ltd. Grant—The Atlantic Union Oil Co. Pty. Ltd. donated the sum of £10 10s. 0d. towards the cost of establishing a library in the School of Accountancy.

Metal Manufactures Ltd. Grant—£2,500 has been donated by Metal Manufactures Ltd. towards cost of University buildings at Wollongong.

Australian Fertilizers Ltd.—A grant of £500 was made by Australian Fertilizers also towards the cost of University buildings at Wollongong.

"W. E. Clegg Memorial" Prize Fund—The City of Newcastle has contributed £106 10s. 0d. towards the establishment of the "W. E. Clegg Memorial" Prize Fund.

Broken Hill Mining Managers' Association—The Broken Hill Mining Managers' Association donated £500 towards the visit overseas of Professor D. W. Phillips, Pro-Vice-Chancellor and Professor of Mining Engineering.

Monsanto Chemicals (Aust.) Ltd. Grant—Monsanto Chemicals (Aust.) Ltd. have contributed £400 for research to be undertaken in the School of Chemical Engineering.

Grants towards Purchase of Mass Spectrometer—The organisations listed below have contributed sums totalling £14,700 towards the cost of a mass spectrometer for the School of Chemistry.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Atomic Energy Commission</td>
<td>5,000</td>
</tr>
<tr>
<td>Timbrol Ltd.</td>
<td>200</td>
</tr>
<tr>
<td>Australian Gas Light Co.</td>
<td>1,000</td>
</tr>
<tr>
<td>Imperial Chemical Industries of Australia and New Zealand Ltd...</td>
<td>2,000</td>
</tr>
<tr>
<td>New South Wales State Cancer Council</td>
<td>6,500</td>
</tr>
</tbody>
</table>
Food Processing Industries Scholarship Fund—Donations were made during the year to the Food Processing Industries Scholarship Fund by the following organisations:

<table>
<thead>
<tr>
<th>Organisation</th>
<th>£</th>
<th>s</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unilever Australia Pty. Ltd.</td>
<td>400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Albright and Wilson (Aust.) Pty. Ltd.</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cottees Passiona Ltd.</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Harry Peck and Co. (Aust.) Pty. Ltd.</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rural Bank of N.S.W.</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Donations towards Establishing Degree Course in Industrial Relations, School of Economics—Donations towards the establishment of a degree course in Industrial Relations in the School of Economics were received from the following organisations:

<table>
<thead>
<tr>
<th>Organisation</th>
<th>£</th>
<th>s</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colonial Sugar Refining Co. Ltd.</td>
<td>200</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Australian Consolidated Industries Ltd.</td>
<td>200</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The Shell Co. of Australia Ltd.</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chamber of Manufactures of New South Wales</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ford Motor Co. of Australia Pty. Ltd.</td>
<td>250</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Retail Traders' Association of New South Wales</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Standard Telephones and Cables Pty. Ltd.</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Commonwealth Scientific and Industrial Research Organisation Grants—A further sum of £11,100 has been donated by the Commonwealth Scientific and Industrial Research Organisation for research into the following projects:

- Agricultural Engineering.
- Control of cattle tick.
- Wool research.

Australian Atomic Energy Commission Grants—Further grants totalling £12,700 have been made by the Australian Atomic Energy Commission for research by the Schools of Chemical Engineering and Metallurgy into the following projects:

- Levitation, melting, and extraction metallurgy.
- Extraction of thorium and rare earths.
- High temperature uranium and thorium fuel elements.

New South Wales State Cancer Council Research Grant—The New South Wales State Cancer Council made available a total of £3,220, for research being undertaken in the Schools of Chemistry and Biological Sciences.
Commonwealth Bank Grants from Rural Credits Development Fund—
A grant of £2,000 was made during the year for research into the relationship of rainfall to run-off, being carried out in the School of Civil Engineering.

Department of Main Roads Grant for Chair in Highway Engineering—The Department of Main Roads has made a further grant of £5,000 for the maintenance of the Chair of Highway Engineering.

Wool Research Trust Fund Grant—The Department of Primary Industry has donated £3,500 from the Wool Research Trust Fund for research by the School of Textile Technology into—
(a) the yellowing of wool and surface active agents in wool finishing;
(b) the accelerated ageing of worsted manufacture.

Commonwealth Department of Primary Industry Grant—The Commonwealth Department of Primary Industry donated the sum of £200 towards travelling expenses connected with research being carried out by the staff of the School of Wool Technology.

Commonwealth Bank of Australia Grant—The Commonwealth Bank of Australia made available £1,000 towards the expenses of a visit overseas by Associate Professor J. F. D. Wood.

Commonwealth Department of Primary Industry, Wheat Industry Research Council Grant—The sum of £5,665 was received during the year from the Commonwealth Department of Primary Industry for research into wheat being undertaken in the School of Mechanical Engineering.

Accounts

Statements showing the position of the various funds of the University as at 30th June, 1958, duly certified by the Auditor-General, are appended to this Report.

WALLACE C. WURTH, Chancellor.
APPENDIX I

The Council

The Council held five ordinary meetings and three special meetings during the year. The attendance of members was as follows:—

Chancellor of the University

Wallace Charles Wurth, C.M.G., LL.B., Chairman of the New South Wales Public Service Board—four meetings.*

Deputy Chancellor

The Hon. John Sydney James Clancy, LL.B., Justice of the Supreme Court—seven meetings.

Vice-Chancellor


Pro-Vice-Chancellor


Members

Stephen John Charles Angyal, Ph.D., F.R.A.C.I., Associate Professor of Organic Chemistry, New South Wales University of Technology—four meetings.*


James Noel Barrett, Grazer; Secretary, Northern Division, Wheatgrowers' Union of New South Wales—three meetings.


Harold Graydon Conde, C.M.G., M.I.E.Aust., Manager, Electric Light and Power Supply Corp. Ltd.; Electricity Commissioner, New South Wales—one meeting.*


Robert Clarence Gibson, C.M.G., General President, Primary Producers’ Union—five meetings.


John William Goodsell, C.M.G., F.A.S.A., President, Metropolitan Water, Sewerage and Drainage Board—seven meetings.

Harry Frederick Heath, B.A., B.Ec., Member, New South Wales Public Service Board—eight meetings.


John Patrick Kennedy, B.Sc., General Motors-Holden’s Scholar, School of Wool Technology—eight meetings.

William George Kett, Hon. D.Sc., F.I.O. (Lond.), Past President, Australian Optometrical Association; Director, Mark Foy’s Ltd.—six meetings.

The Hon. Robert Arthur King, M.L.C., Secretary, Labour Council of New South Wales—two meetings.*


The Hon. James Joseph Maloney, M.L.C., Minister for Labour and Industry—four meetings.


Crawford Hugh Munro, B.E., F.R.San.I., M.I.E.Aust., Professor of Civil Engineering, New South Wales University of Technology—seven meetings.
RUPERT HORACE MYERS, M.Sc., Ph.D., F.I.M., F.R.A.C.I., A.M. Aus.I.M.M., Professor of Metallurgy and Dean of the Faculty of Technology, New South Wales University of Technology—eight meetings.

PETER JOHN O'NEILL, B.E., Engineer, Postmaster-General's Department—seven meetings.


GERALD FREDERICK RHOADES, B.Sc., A.S.T.C., Chemist, Taubman's Industries Ltd.—seven meetings.

STEPHEN HENRY ROBERTS, C.M.G., M.A., Litt.D., D.Sc. (Econ.), LL.D., D.C.L., Vice-Chancellor and Principal, The University of Sydney—one meeting.*

EUGENE BRYAN SMYTH, F.A.S.A., A.C.I.S., A.S.T.C., Professor of Accountancy, New South Wales University of Technology—eight meetings.

ROBERT HENRY SUTHERLAND, Assistant General Secretary, Public Service Association of New South Wales—six meetings.

GREGORY BÉDE THOMAS, LL.B., B.Sc., B.E., Barrister—seven meetings.

JOHN BASIL THORNTON, B.A., B.Sc., Associate Professor of Philosophy, New South Wales University of Technology—six meetings.

ROBERT JOSEPH WEBSTER, C.B.E., M.C., A.A.A., Past President, The Australian Institute of Management, Sydney Division; Chairman of Directors and Managing Director, Burlington Mills (Aust.) Limited; Managing Director, Bradford Cotton Mills Limited—six meetings.

JOHN FELL DALRYMLE WOOD, B.Sc., B.E., A.M.I.E.Aust., Associate Professor of Mechanical Engineering, New South Wales University of Technology—four meetings.*


* During the year leave of absence from Council meetings for various periods was granted to the Chancellor; to Professors Angyal, Roberts and Wood; to Drs. Denning and MacDougall, and to Messrs. Conde and King.
APPENDIX II
Standing Committees of Council

The membership of the standing committees of Council is as follows:

Executive Committee:
The Chancellor (Chairman).
The Deputy Chancellor.
The Vice-Chancellor.
Dr. A. Denning.
Mr. J. W. Goodsell.
Dr. W. G. Kett.
Mr. W. R. Laurie.
Dr. J. K. MacDougall.
Professor R. H. Myers.
Professor D. W. Phillips.
Professor S. H. Roberts.
Mr. R. J. Webster.

Finance Sub-Committee of the Executive Committee:
Mr. J. W. Goodsell (Chairman).
The Vice-Chancellor.
Mr. H. F. Heath.
Professor R. H. Myers.
Professor F. B. Smyth.
Mr. R. J. Webster.

Personnel Sub-Committee of the Executive Committee:
The Chancellor (Chairman).
The Deputy Chancellor.
The Vice-Chancellor.
Dr. W. G. Kett.
Mr. J. W. Goodsell.

Academic Committee:
The Deputy Chancellor (Chairman).
The Vice-Chancellor.
Dr. A. Denning.
Mr. H. F. Heath.
Mr. J. P. Kennedy.
Dr. W. G. Kett.
Mr. F. M. Mathews.
Professor R. H. Myers.
Professor D. W. Phillips.
Mr. G. F. Rhoades.
Mr. G. B. Thomas.
Associate Professor J. B. Thornton.
Associate Professor J. F. D. Wood.
Dr. H. S. Wyndham.
Buildings and Equipment Committee:

Mr. W. R. Laurie (Chairman).
The Vice-Chancellor.
Mr. H. G. Conde.
Mr. R. C. Gibson.
The Hon. W. M. Gollan.
Mr. H. F. Heath.
Captain G. I. D. Hutcheson.
The Hon. R. A. King.
Dr. J. K. MacDougall.
Mr. D. L. McLarty.
Professor C. H. Munro.
Professor D. W. Phillips.
Mr. G. B. Thomas.

Library Committee:

Dr. W. G. Kett (Chairman).
The Vice-Chancellor.
Associate Professor S. J. C. Angyal.
Mr. R. A. Corin.
The Hon. J. J. Maloney.
Mr. P. J. O'Neill.
Professor D. W. Phillips.
Mr. G. B. Thomas.
Associate Professor J. B. Thornton.

Public Relations Committee:

Mr. R. J. Webster (Chairman).
The Vice-Chancellor.
Mr. J. N. Barrett.
Capt. G. I. D. Hutcheson.
The Hon. J. J. Maloney.
Mr. F. M. Mathews.
Dr. R. G. C. Parry-Okeden.
Mr. R. H. Sutherland.

Appeals Committee:

The Chancellor.
The Deputy Chancellor.
Member of Council nominated by association representing staff members or member of Council nominated by appellant students.
APPENDIX III

Awards of Scholarships for 1958

Scholarships during the period under review were held as set out hereunder:

The Arnott Scholarship in Food Technology:
Jennifer A. Dawes—first year, Food Technology.

Atmospheric Pollution Research Fellowship:
P. L. Spedding—Master of Science Candidate, School of Chemical Engineering.

Australian Atomic Energy Commission Research Studentships:
L. A. Cambey—Doctor of Philosophy Candidate, School of Applied Physics.
C. J. Cripps Clark—Master of Science Candidate, School of Metallurgy.
T. L. Judell—Doctor of Philosophy Candidate, School of Chemical Engineering.
P. Kenny—Doctor of Philosophy Candidate, School of Textile Technology.
J. W. Lee—Doctor of Philosophy Candidate, School of Chemistry.
D. J. Magnusson—Doctor of Philosophy Candidate, School of Mechanical Engineering.
A. S. Malin—Master of Science Candidate, School of Metallurgy.
K. H. Napier—Doctor of Philosophy Candidate, School of Chemistry.

Australian Atomic Energy Commission Undergraduate Scholarships:
L. A. Baker—second year, Metallurgy.
G. W. Cox—second year, Metallurgy.
N. R. McDonald—third year, Metallurgy.

Australian Coal Association (Research) Ltd. Scholarships:
M. N. Booker—third year, Mining Engineering.
D. W. Burton—first year, Mining Engineering.

Australian Cream Tartar/Chrome Chemicals Joint Scholarship in Chemical Engineering:
C. Fell—second year, Chemical Engineering.
Bond's Industries Scholarship in Textile Technology:
P. G. Burton—first year, Textile Technology.

Bradford Cotton Mills Pty. Ltd. Scholarships in Textile Technology:
E. W. Perrett—first year, Textile Technology.
T. L. Simmons—second year, Textile Technology.

Commonwealth Wool Industry Fund Scholarships:
F. E. Brennan—first year, Textile Technology.
Elizabeth A. Capper—first year, Wool Technology.
R. E. Griffith—second year, Textile Technology.
Pamela H. Hetherington—first year, Textile Technology.
R. C. Jones—second year, Wool Technology.
J. G. Mulholland—first year, Wool Technology.
G. Pemberton—second year, Textile Technology.
P. W. Weiss—second year, Wool Technology.
R. B. Whan—fourth year, Wool Technology.

Davies Coop Scholarships in Textile Technology:
R. Postle—first year, Textile Technology.
R. G. Steadman—second year, Textile Technology.

Elliott's (D.H.A. Rural Division) Scholarship in Wool Technology:
P. D. Morgan—first year, Wool Technology.

Felt and Textiles of Australia Ltd. Scholarships in Textile Technology:
J. Dunlop—second year, Textile Technology.
R. L. Orwell—second year, Textile Technology.

General Motors-Holden's Post-Graduate Research Fellowships:
J. W. F. Hitchon—Doctor of Philosophy Candidate, School of Metallurgy.
J. P. Kennedy—Master of Science Candidate, School of Wool Technology.

Hoover Scholarship in Electrical Engineering:
G. Doherty—first year, Electrical Engineering.

Imperial Chemical Industries of Australia and New Zealand Research Fellowship:
T. N. Lockyer—Master of Science Candidate, School of Chemistry.

John Vicars and Co. Ltd. Scholarship in Textile Technology:
J. D. Collins—second year, Textile Technology.

Joint Coal Board Scholarships:
J. F. Ashcroft—third year, Mining Engineering.
B. Greiss—fourth year, Mining Engineering.
E. M. Howells—fourth year, Mining Engineering.
Mauri Bros. and Thomson Ltd. Scholarship in Food Technology:
  H. G. T. Coster—second year, Food Technology.

Mining and Metallurgical Bursaries Fund Scholarships:
  D. J. H. Corderoy—fourth year, Metallurgy.
  R. J. Johnson—third year, Metallurgy.
  R. P. Kirkpatrick—third year, Mining Engineering.
  N. R. McDonald—third year, Metallurgy.
  N. W. Neasby—third year, Metallurgy.
  M. Wrench—fourth year, Metallurgy.

Nock and Kirby Scholarship in Accountancy:
  D. W. Griffin—fourth year, Commerce.

W. D. Scott and Co. Scholarship in Textile Technology:
  J. M. Waters—second year, Textile Technology.

Swiss Textile Machine Industries Scholarship in Textile Technology:
  P. D. Lorschy—first year, Textile Technology.

Water Research Foundation of Australia Ltd. Fellowships:
  D. N. Body—Master of Engineering Candidate, School of Civil Engineering.
  F. J. Gardiner—Research Student, School of Civil Engineering.

Weston Organisation Scholarship in Food Technology:
  A. R. Morgan—first year, Food Technology.

William Cooper and Nephews Scholarship in Wool Technology:
  S. A. S. Douglas—first year, Wool Technology.

Bursaries and Exhibitions
  P. Barber—first year, Chemical Engineering.
  M. G. Bonner—third year, Civil Engineering.
  P. J. Cummins—second year, Civil Engineering.
  D. A. March—third year, Arts (Newcastle University College).
  A. J. Morton—second year, Metallurgy.

Exhibitions
  Y. P. Chen—third year, Chemical Engineering.
  K. Y. Wong—second year, Electrical Engineering.
Commonwealth Scholarships

Full-time Degree Students:

G. S. Adam—first year, Metallurgy.
M. Ainsworth—second year, Textile Technology.
D. V. Allen—first year, Metallurgy.
P. R. Aston—first year, Electrical Engineering.
G. Balak—fourth year, Chemical Engineering.
W. E. Bamford—fourth year, Applied Geology.
P. Barber—first year, Science.
C. R. Barker—third year, Electrical Engineering.
G. R. Barker—first year, Chemical Engineering.
G. E. Batley—first year, Applied Chemistry.
J. C. Beaton—first year, Electrical Engineering.
J. H. Beehag—second year, Chemical Engineering.
P. W. Beer—second year, Mining Engineering.
I. J. Bersten—second year, Commerce.
G. Berzins—third year, Electrical Engineering.
E. W. Bishop—third year, Mechanical Engineering.
M. G. Bonner—third year, Mechanical Engineering.
A. J. M. Boughton—first year, Chemical Engineering.
P. R. Bower—first year, Commerce.
K. Brady—third year, Architecture.
I. O. Briggs—second year, Textile Technology.
K. J. Burnett—first year, Industrial Engineering.
G. W. Burton—first year, Architecture.
K. H. Campbell—second year, Civil Engineering.
E. R. Cantrill—first year, Applied Chemistry.
W. N. J. Carrington—first year, Electrical Engineering.
G. J. Celnians—fourth year, Applied Chemistry.
R. P. Clinton—fourth year, Architecture.
J. C. Colman—second year, Textile Technology.
G. Comanos—first year, Metallurgy.
D. J. H. Corderoy—fourth year, Metallurgy.
H. G. L. Coster—second year, Food Technology.
J. D. Court—second year, Chemical Engineering.
P. M. Coward—sixth year, Architecture.
N. E. Cowell—second year, Electrical Engineering.
A. A. Cram—third year, Civil Engineering.
P. R. Crommer—second year, Commerce.
P. J. Cummins—second year, Civil Engineering.
J. E. Davies—third year, Applied Chemistry.
I. Davison—second year, Mechanical Engineering.
Jennifer A. Dawes—first year, Food Technology.
P. J. Dawson—first year, Civil Engineering.
J. A. Deall—third year, Mechanical Engineering.
A. B. Dean—fourth year, Food Technology.
R. J. M. Delbridge—third year, Chemical Engineering.
W. G. Demmler—first year, Applied Chemistry.
W. W. Donald—third year, Electrical Engineering.
K. J. Drake—third year, Chemical Engineering.
R. B. Dunn—third year, Architecture.
H. G. Eiler—second year, Mechanical Engineering.
L. Elber—first year, Electrical Engineering.
M. G. Ellis—fourth year, Electrical Engineering.
R. J. Enright—fourth year, Mining Engineering.
Full-time Degree Students—continued:

I. T. Ernst—third year, Applied Chemistry.
A. B. Eshman—first year, Applied Chemistry.
K. Falk—fourth year, Architecture.
R. G. Farrell—fourth year, Mechanical Engineering.
C. J. D. Fell—second year, Chemical Engineering.
P. L. Fitz—second year, Textile Technology.
A. I. Forbes—second year, Civil Engineering.
R. B. A. Fredericks—second year, Civil Engineering.
G. J. French—third year, Architecture.
V. D. French—second year, Metallurgy.
N. R. Godfrey—second year, Electrical Engineering.
J. N. Gordon—sixth year, Architecture.
B. W. Graham—first year, Metallurgy.
R. L. W. Graham—first year, Surveying.
F. Graudins—first year, Civil Engineering.
R. P. Gyde—second year, Mechanical Engineering.
D. T. Hanly—fourth year, Architecture.
P. J. Harper—second year, Applied Chemistry.
G. C. Harris—second year, Chemical Engineering.
J. W. Hayes—third year, Applied Chemistry.
J. R. Hazell—third year, Civil Engineering.
L. C. Heyman—first year, Architecture.
H. J. Hodges—fourth year, Architecture.
G. E. Holland—fourth year, Architecture.
K. B. D. Holland—third year, Mechanical Engineering.
J. W. Hollis—second year, Mechanical Engineering.
R. W. Hubery—third year, Chemical Engineering.
J. S. Hyslop—third year, Civil Engineering.
B. D. Inglis—first year, Mechanical Engineering.
I. H. Irwin—fourth year, Metallurgy.
R. M. S. Irwin—second year, Textile Technology.
P. N. Jamieson—second year, Metallurgy.
P. J. Johnson—third year, Metallurgy.
K. A. Johnston—first year, Metallurgy.
S. Johnston—second year, Mechanical Engineering.
P. T. Joyce—first year, Metallurgy.
A. Karkins—fifth year, Architecture.
P. Kelly—second year, Chemical Engineering.
F. E. Kernebone—second year, Chemical Engineering.
R. A. Kinsky—second year, Mechanical Engineering.
K. O. Krust—second year, Chemical Engineering.
D. T. Lacey—fourth year, Chemical Engineering.
J. A. Lake—second year, Architecture.
I. H. Landon-Smith—second year, Mechanical Engineering.
M. F. Leahy—fourth year, Civil Engineering.
G. G. Lee—fourth year, Mechanical Engineering.
T. H. Lee—first year, Food Technology.
T. Lee—first year, Mechanical Engineering.
H. J. W. Leong—third year, Civil Engineering.
B. W. Lewis—first year, Commerce.
T. B. Liggins—third year, Civil Engineering.
D. A. Littlemore—third year, Architecture.
Commonwealth Scholarships

Full-time Degree Students—continued:

C. J. Lunin—first year, Science.
C. J. MacKenzie—third year, Civil Engineering.
I. A. MacTavish—first year, Metallurgy.
A. K. McCormack—first year, Mechanical Engineering.
I. G. McCullagh—second year, Chemical Engineering.
B. A. McDonald—first year, Electrical Engineering.
A. D. McGaur—second year, Commerce.
I. J. McKee—first year, Metallurgy.
P. D. McLeod—second year, Chemical Engineering.
A. L. McNell—second year, Commerce.
P. McPaul—fourth year, Mining Engineering.
D. F. Maggs—second year, Applied Geology.
H. K. Maroli—third year, Architecture.
P. J. Mason—first year, Electrical Engineering.
J. Matthews—third year, Applied Chemistry.
A. V. Milton—third year, Commerce.
P. M. Milward-Bason—first year, Chemical Engineering.
R. L. Mitchell—first year, Mechanical Engineering.
F. Moretti—second year, Mechanical Engineering.
A. J. Morgan—second year, Civil Engineering.
M. E. Morgan—third year, Mechanical Engineering.
W. D. Mosman—third year, Architecture.
J. W. Mutton—second year, Mechanical Engineering.
P. Nash—second year, Textile Technology.
N. W. Neasbey—third year, Metallurgy.
R. C. Nelson—first year, Civil Engineering.
A. C. Nichols—fourth year, Chemical Engineering.
F. Ninio—third year, Applied Physics.
P. O'Brien—second year, Textile Technology.
B. D. O'Reilly—second year, Civil Engineering.
M. K. Ormay—fourth year, Metallurgy.
K. C. Parkes—first year, Chemical Engineering.
Dianne J. Parrott—fourth year, Architecture.
J. L. Pascoe—fourth year, Applied Chemistry.
D. J. Paterson—second year, Civil Engineering.
M. C. Payten—fourth year, Electrical Engineering.
S. J. Phillips—second year, Mechanical Engineering.
P. Piira—fourth year, Civil Engineering.
V. Popowski—third year, Chemical Engineering.
J. Raffaele—fourth year, Civil Engineering.
M. R. Rayner—fourth year, Chemical Engineering.
H. Reiman—first year, Metallurgy.
J. W. Reiner—third year, Electrical Engineering.
E. E. Revel—second year, Mechanical Engineering.
J. R. Rileigh—third year, Chemical Engineering.
P. J. Ring—third year, Mechanical Engineering.
J. Ringis—first year, Applied Geology.
B. W. Roberts—fourth year, Mechanical Engineering.
L. F. Robertson—fourth year, Architecture.
J. Roseth—fourth year, Architecture.
J. W. Rudd—fourth year, Mechanical Engineering.
G. S. Rudder—first year, Commerce.
Commonwealth Scholarships

Full-time Degree Students—continued:

J. M. Ryder—first year, Science.
J. E. Sanders—third year, Civil Engineering.
G. D. Sheather—first year, Architecture.
S. D. Sheedy—third year, Architecture.
P. B. Sietzema—fourth year, Chemical Engineering.
H. Simon—second year, Textile Technology.
A. G. Simons—second year, Electrical Engineering.
J. R. Simpson—third year, Civil Engineering.
V. A. Sivis—second year, Civil Engineering.
G. G. Smart—fourth year, Architecture.
I. L. Smith—second year, Civil Engineering.
B. R. Smith-Roberts—first year, Commerce.
B. K. Snow—third year, Civil Engineering.
B. Spooner—first year, Chemical Engineering.
B. C. Springthorpe—second year, Chemical Engineering.
B. R. Stanmore—fourth year, Chemical Engineering.
K. N. Stanton—fourth year, Electrical Engineering.
K. R. Steggers—second year, Applied Geology.
W. Steller—sixth year, Architecture.
P. J. Stephenson—first year, Metallurgy.
B. E. Szaboles—fifth year, Architecture.
R. G. Tanner—third year, Architecture.
B. M. Taylor—fourth year, Architecture.
P. J. Taylor—fourth year, Civil Engineering.
V. Trankels—third year, Architecture.
J. E. Tremain—first year, Metallurgy.
D. F. Trinder—third year, Architecture.
R. F. Tuddenham—fourth year, Applied Chemistry.
A. R. Van-Es—first year, Chemical Engineering.
B. M. Vaughan—second year, Metallurgy.
L. D. Vilensky—second year, Textile Technology.
P. J. Vlattas—second year, Architecture.
P. Wagonberg—first year, Mechanical Engineering.
F. B. Wailes—first year, Metallurgy.
R. D. Walker—second year, Metallurgy.
D. C. Wallis—second year, Chemical Engineering.
G. S. Watson—fourth year, Mechanical Engineering.
L. S. Watson—second year, Mechanical Engineering.
R. A. Wells—third year, Chemical Engineering.
D. McK. Williams—first year, Science.
M. A. Windass—second year, Architecture.
D. G. Wood—fourth year, Chemical Engineering.
M. Wootton—first year, Science.
G. K. Wyatt—fourth year, Chemical Engineering.
W. O. Yandell—second year, Civil Engineering.
R. M. Yared—second year, Textile Technology.
A. Yee—first year, Chemical Engineering.
Commonwealth Scholarships

Part-time Degree and Diploma Students:

A. G. Abrahams—third year, Commerce.
R. M. Adair—fourth year, Mechanical Engineering.
J. Agius—third year, Architecture.
J. M. Anderson—fourth year, Applied Chemistry.
J. B. Anderson—fifth year, Mechanical Engineering.
T. F. Anderson—sixth year, Applied Chemistry.
J. N. Arnold—fourth year, Architecture.
B. R. Ashton—first year, Industrial Chemistry.
W. W. Ashton—fourth year, Architecture.
M. J. Atkins—third year, Chemical Engineering.
V. J. Audet—third year, Radio Engineering.
L. E. Avery—second year, Commerce.
R. R. Ayres—first year, Commerce.
J. R. Bagshaw—fourth year, Applied Chemistry.
G. W. Baillie—fifth year, Civil Engineering.
R. L. Barnes—second year, Commerce.
D. G. Barnsdall—third year, Commerce.
Jeanette E. Barr—second year, Applied Biology.
R. A. Batchelor—fourth year, Radio Engineering.
G. E. Beard—first year, Electrical Engineering.
D. J. Beer—third year, Architecture.
P. J. Benjamin—fourth year, Commerce.
B. N. Bennison—third year, Radio Engineering.
R. P. Bible—third year, Commerce.
Ruth W. Bicknell—first year, Applied Biology.
J. A. Birch—first year, Applied Physics (Conversion).
B. R. Boardman—fourth year, Optometrical Science.
K. W. Bock—second year, Commerce.
R. F. E. Bolton—fourth year, Industrial Chemistry.
G. J. Boshell—fifth year, Applied Chemistry.
W. B. Bowden—fourth year, Architecture.
Faye M. Bowen—second year, Applied Biology.
K. R. Boyes—first year, Industrial Chemistry.
G. J. Boys—second year, Architecture.
J. W. Boys—third year, Building.
P. L. Bradhurst—fifth year, Metallurgy.
G. W. Brawn—second year, Architecture.
R. G. Brissett—fourth year, Civil Engineering.
P. J. Brown—first year, Surveying.
J. R. Bruce—second year, Architecture.
R. A. Bruce—fourth year, Architecture.
R. S. Brunton—second year, Metallurgy.
R. J. Bryant—third year, Architecture.
J. W. Buchanan—fourth year, Architecture.
M. A. Bures—third year, Architecture.
G. Burke—fourth year, Building.
R. P. Bywater—fourth year, Electrical Engineering.
F. J. Callinan—second year, Civil Engineering.
J. A. Campbell—first year, Optometrical Science (Conversion).
P. T. Carey—second year, Applied Chemistry.
G. J. Carr—third year, Applied Chemistry.
E. A. Carter—second year, Mechanical Engineering.
D. F. Cartwright—fourth year, Applied Chemistry.
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<tr>
<th>Name</th>
<th>Year</th>
<th>Course</th>
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<td>C. W. Eldridge</td>
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<td>Production Engineering</td>
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<td>R. J. Ellershaw</td>
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<td>L. E. Esquilant</td>
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<td>N. Fabrello</td>
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<td>J. R. Fenwick</td>
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<td>Architecture</td>
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Commonwealth Scholarships

Part-time Degree and Diploma Students—continued:

B. J. Findlay—third year, Accountancy.
G. MoN. Finlay—second year, Commerce.
R. J. Finlayson—first year, Science.
W. Firkin—second year, Architecture.
P. G. Fish—second year, Commerce.
R. G. Fraser—second year, Architecture.
J. R. Freeman—second year, Chemical Engineering.
W. W. Gallagher—third year, Applied Chemistry.
N. F. Gilbertorph—second year, Architecture.
C. O. Gillard—third year, Accountancy.
B. P. Gillies—second year, Civil Engineering.
R. W. Gilmour—fifth year, Metallurgy.
R. W. Godden—second year, Commerce.
P. F. Goaling—fourth year, Commerce.
J. A. Gould—third year, Civil Engineering.
D. C. Grace—second year, Accountancy.
A. Gray—sixth year, Chemical Engineering.
D. S. Gray—first year, Industrial Engineering.
I. R. Gray—third year, Chemical Engineering.
K. H. Green—third year, Quantity Surveying.
G. E. C. Greenham—fourth year, Mechanical Engineering.
J. Greste—sixth year, Architecture.
D. A. Grey—sixth year, Industrial Chemistry.
R. F. Griffin—fifth year, Chemical Engineering.
R. B. Griffiths—third year, Industrial Engineering.
D. A. Groves—third year, Building.
I. H. Hackett—first year, Chemical Engineering.
R. F. Haile—third year, Industrial Chemistry.
F. G. Hall—second year, Industrial Chemistry.
J. D. Halliday—second year, Commerce.
J. Hanich—third year, Chemical Engineering.
T. M. P. Hardie—second year, Commerce.
E. Hardinge—fourth year, Applied Chemistry.
K. J. Hargreaves—fourth year, Industrial Chemistry.
R. A. Harris—third year, Industrial Chemistry.
D. A. E. Harrison—third year, Chemical Engineering.
K. A. Hassall—sixth year, Architecture.
G. J. Hay—fifth year, Surveying.
L. J. Henderson—fourth year, Applied Chemistry.
G. D. Herman—seventh year, Chemical Engineering.
M. J. High—fourth year, Commerce.
L. W. Hillen—third year, Applied Chemistry.
J. R. P. Hocking—fifth year, Mechanical Engineering.
R. E. Hockley—second year, Radio Engineering.
D. J. Holm—fourth year, Commerce.
R. J. Holt—first year, Electrical Engineering (Conversion).
R. J. Hooper—third year, Architecture.
S. W. Horwood—second year, Production Engineering.
B. F. Hoskins—sixth year, Applied Chemistry.
R. M. Hoskinson—third year, Applied Chemistry.
A. M. Howard—fourth year, Architecture.
I. J. Howard—seventh year, Chemical Engineering.
P. G. Hughes—second year, Architecture.
J. D. Hutchison—second year, Chemical Engineering.
P. J. Hutchison—second year, Chemical Engineering.
Commonwealth Scholarships

Part-time Degree and Diploma Students—continued:

F. J. Jackson—second year, Applied Chemistry.
L. B. James—third year, Chemical Engineering.
G. J. Jameson—sixth year, Chemical Engineering.
B. A. Jay—fourth year, Electrical Engineering.
W. H. Jay—fifth year, Chemical Engineering.
A. D. Jefferson—fourth year, Industrial Chemistry.
D. B. Jeffrey—second year, Mechanical Engineering.
N. W. Jenkins—first year, Commerce.
W. R. Jenkins—second year, Architecture.
M. R. Jones—fourth year, Applied Chemistry.
R. G. Jones—second year, Commerce.
A. Jostons—fourth year, Metallurgy.
I. E. Joyce—second year, Commerce.
M. J. Kabat—third year, Chemical Engineering.
H. J. Kavanagh—second year, Chemical Engineering.
R. W. Kay—second year, Metallurgy.
N. V. Kelvin—second year, Chemical Engineering.
R. W. Kennan—second year, Chemical Engineering.
D. R. Kennard—third year, Accountancy.
R. J. Kennard—third year, Accountancy.
R. P. Keppie—second year, Civil Engineering.
A. J. King—second year, Commerce.
B. F. V. King—fourth year, Commerce.
K. D. King—second year, Chemical Engineering.
G. Kovivos—second year, Commerce.
C. Kringas—sixth year, Architecture.
I. J. Lackenby—second year, Surveying.
P. R. Langley—second year, Mechanical Engineering.
F. L. Langshaw—fifth year, Mechanical Engineering.
A. D. Larkins—second year, Applied Chemistry.
A. W. Lawrence—sixth year, Architecture.
R. J. Lawrence—second year, Radio Engineering.
E. J. Lee—fourth year, Chemical Engineering.
F. A. Lee—fifth year, Food Technology.
J. A. Leonard—second year, Architecture.
W. J. Leroy—third year, Architecture.
P. A. Levy—first year, Industrial Chemistry.
B. W. Little—third year, Architecture.
B. J. Lourey—fourth year, Applied Chemistry.
D. A. Lowe—second year, Chemical Engineering.
M. J. Lowrey—fourth year, Civil Engineering.
W. Mackay—third year, Commerce.
Helen R. McAdoo—first year, Science.
G. A. McCaughtrie—third year, Metallurgy.
P. I. McClelland—third year, Electrical Engineering.
A. K. McCoy—fifth year, Applied Chemistry.
D. J. McCroy—fourth year, Electrical Engineering.
B. D. McDonald—fifth year, Accountancy.
D. B. McDonald—fourth year, Commerce.
J. R. C. Mcdonald—fourth year, Applied Chemistry.
D. B. McFadyen—second year, Architecture.
J. McL. McKay—third year, Applied Chemistry.
R. S. McKay—third year, Architecture.
Commonwealth Scholarships

Part-time Degree and Diploma Students—continued:

G. V. McLeod—fifth year, Electrical Engineering.
I. B. McMartin—third year, Optometrical Science.
J. B. McNally—third year, Architecture.
G. A. McRae—second year, Metallurgy.
K. J. L. McVicker—second year, Commerce.
E. Maidment—seventh year, Chemical Engineering.
D. R. Mander-Jones—sixth year, Architecture.
G. S. Mar—fifth year, Accountancy.
W. A. Marsden—first year, Mechanical Engineering.
A. S. Martin—fifth year, Accountancy.
W. H. Martin—third year, Civil Engineering.
G. A. Marx—second year, Commerce.
A. J. Masnick—third year, Optometrical Science.
F. J. Merryfull—second year, Architecture.
P. W. Middleton—second year, Commerce.
P. G. M. Illington—first year, Civil Engineering.
A. J. Moore—second year, Chemical Engineering.
R. J. Morgan—second year, Industrial Chemistry.
W. T. Morris—first year, Optometrical Science.
K. R. Mortram—fifth year, Building.
R. Muhs—third year, Commerce.
B. J. Mullen—fourth year, Applied Chemistry.
G. M. Murcutt—third year, Architecture.
K. W. Myles—second year, Applied Psychology.
B. R. Nagel—fourth year, Industrial Chemistry.
D. P. Neilson—second year, Commerce.
A. J. Newton—fourth year, Commerce.
R. J. Nimmo—second year, Civil Engineering.
J. R. Nixon—third year, Commerce.
P. L. Noone—second year, Commerce.
H. Noordewier—fifth year, Applied Chemistry.
B. R. Norris—fifth year, Accountancy.
E. D. Norquay—fourth year, Commerce.
L. M. Noyes—second year, Metallurgy.
G. N. Oates—third year, Architecture.
B. J. O'Brien—fourth year, Applied Chemistry.
K. E. Obert—fifth year, Aeronautical Engineering.
B. P. O'Regan—third year, Applied Chemistry.
D. C. Orrock—fourth year, Accountancy.
P. A. E. Pajor—fourth year, Industrial Chemistry.
J. I. Pardey—third year, Architecture.
M. Parke—fourth year, Applied Chemistry.
J. H. Parker—second year, Commerce (Conversion).
J. J. Pass—third year, Commerce.
B. A. Patton—second year, Commerce.
T. S. Pears—third year, Architecture.
D. L. Pearsall—fourth year, Commerce.
J. C. Peet—third year, Quantity Surveying.
L. S. R. Peterkin—fourth year, Commerce.
G. L. Piper—second year, Chemical Engineering.
C. F. Pitchfork—second year, Chemical Engineering.
R. C. M. De Plater—fifth year, Metallurgy.
M. R. Powditch—fourth year, Accountancy.
**Commonwealth Scholarships**

**Part-time Degree and Diploma Students—continued:**

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<th>Name</th>
<th>Year</th>
<th>Field</th>
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<tr>
<td>J. P. Stone</td>
<td>third</td>
<td>Civil Engineering</td>
</tr>
</tbody>
</table>

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Commonwealth Scholarships

Part-time Degree and Diploma Students—continued:

S. Strasser—fourth year, Optometrical Science.
K. R. Stubbs—fourth year, Civil Engineering.
V. J. Summersby—fifth year, Civil Engineering.
I. H. Thackray—fourth year, Optometrical Science.
A. D. Theakstone—third year, Architecture.
D. H. Thitchener—second year, Chemical Engineering.
A. A. Thompson—third year, Radio Engineering.
B. E. Thompson—seventh year, Industrial Chemistry.
W. K. Thomson—fourth year, Applied Chemistry.
F. C. Thorvaldson—sixth year, Architecture.
S. R. Tibbles—second year, Chemical Engineering.
J. J. Tille—second year, Science.
D. A. Towson—fourth year, Commerce.
J. C. Trinder—second year, Surveying.
R. Uhlherr—fifth year, Mechanical Engineering.
K. J. Van-es—third year, Civil Engineering.
D. L. Vass—third year, Commerce.
A. Veenstra—third year, Architecture.
R. P. Vickery—fourth year, Architecture.
B. K. Vote—first year, Architecture.
B. P. Watson—second year, Science.
A. A. Webster—second year, Radio Engineering.
R. B. Webster—Optometrical Science (Conversion).
B. J. Weir—fifth year, Accountancy.
K. L. White—fourth year, Civil Engineering.
W. H. Whittaker—sixth year, Civil Engineering.
B. F. Wild—third year, Electrical Engineering.
C. G. Willis—second year, Industrial Chemistry.
C. J. Wilson—fifth year, Optometrical Science.
D. P. Wilson—fifth year, Civil Engineering.
R. E. Wilson—fourth year, Industrial Chemistry.
A. L. Wingrove—second year, Metallurgy.
B. J. Witham—third year, Commerce (Conversion).
L. J. Woodley—second year, Industrial Chemistry.
W. M. Woods—second year, Radio Engineering.
P. Woodward—first year, Optometrical Science.
P. L. Wright—second year, Commerce.
B. R. Wright—third year, Commerce.
B. P. Wynne—fifth year, Architecture.
C. B. Yates—second year, Commerce.
B. C. Young—first year, Applied Chemistry.
P. C. Young—second year, Mechanical Engineering.
S. Zantiotis—Optometrical Science (Conversion).
Helen M. Ziehlke—third year, Architecture.
Newcastle University College
Commonwealth Scholarships

Full-time Degree Students:

E. J. Ainsworth—first year, Metallurgy.
F. J. Bagnall—third year, Science.
K. H. Bell—third year, Science.
Annette M. Bowe—second year, Arts.
D. P. Buchhorn—first year, Mechanical Engineering.
R. E. Bunton—second year, Civil Engineering.
A. P. Callachor—first year, Applied Chemistry.
G. M. Cocking—third year, Civil Engineering.
W. L. Cooper—third year, Mechanical Engineering.
J. B. Crabtree—third year, Civil Engineering.
L. K. Donaldson-Evans—first year, Arts.
R. H. Eather—first year, Metallurgy.
Kathleen P. Farrell—third year, Arts.
H. L. Ffrench—second year, Arts.
P. E. Galpin—first year, Chemical Engineering.
Margaret P. Glock—third year, Arts.
Julie Goff—fourth year, Arts.
Anna Gorski—first year, Arts.
R. J. Hall—first year, Chemical Engineering.
R. E. Hodge—third year, Arts.
A. J. Kennedy—third year, Civil Engineering.
M. J. Lewis—first year, Arts.
Rachael Lieberman—second year, Arts.
Rosemary Maskey—second year, Arts.
W. Murray—second year, Applied Chemistry.
J. J. O'Shea—first year, Mechanical Engineering.
G. P. Pez—first year, Applied Chemistry.
P. B. Proudfoot—third year, Mechanical Engineering.
C. Resevsky—first year, Mechanical Engineering.
T. W. Riley—first year, Mechanical Engineering.
J. A. Smith—second year, Arts.
P. E. Thomas—second year, Applied Chemistry.
D. P. Tobin—first year, Applied Chemistry.
Lorraine E. Toomey—first year, Arts.
H. S. Vanderbilt—first year, Mechanical Engineering.
Katherine M. Weston—first year, Arts.
B. J. White—first year, Civil Engineering.
C. A. Whitehead—fourth year, Arts.
R. G. Wood—third year, Civil Engineering.

Part-time Degree and Diploma Students:

B. L. Adcock—fourth year, Architecture.
P. H. P. Allen—sixth year, Chemical Engineering.
F. Amos—second year, Metallurgy.
E. W. Andrews—first year, Chemical Engineering.
A. S. Atkins—second year, Arts.
R. K. Barton—first year, Metallurgy.
G. A. Bickerstaff—first year, Chemical Engineering.
C. S. Booth—first year, Commerce.
Commonwealth Scholarships

Part-time Degree and Diploma Students—continued:

R. O. Brock—second year, Civil Engineering.
M. J. Burns—fourth year, Chemical Engineering.
R. B. Burns—second year, Commerce.
P. E. Cahill—third year, Architecture.
A. G. Crouch—second year, Electrical Engineering.
J. R. Cunningham—first year, Metallurgy.
P. J. Dalton—first year, Architecture.
N. B. Dodds—first year, Industrial Chemistry.
D. I. Duncan—second year, Commerce.
J. O. M. Evans—second year, Metallurgy.
G. G. Foster—second year, Commerce.
J. Goth—second year, Commerce.
J. R. Hammond—fourth year, Metallurgy.
A. T. Hart—first year, Industrial Chemistry.
A. J. Hassall—second year, Metallurgy.
G. C. Hay—fourth year, Architecture.
B. D. Henry—eighth year, Chemical Engineering.
D. V. Hilliard—fourth year, Architecture.
J. R. Hoffman—fourth year, Architecture.
K. G. Johnston—first year, Industrial Chemistry.
J. M. Kelly—fourth year, Electrical Engineering.
A. N. Lester—third year, Architecture.
J. A. Lewis—seventh year, Metallurgy.
J. G. Logan—first year, Applied Chemistry.
P. J. Logue—first year, Commerce.
G. H. Lucas—first year, Commerce.
K. H. Miller—first year, Commerce.
D. M. Morley—first year, Metallurgy.
W. L. Munns, first year, Applied Chemistry.
C. J. McConville—second year, Commerce.
J. R. Niland—first year, Commerce.
G. J. O’Brien—second year, Chemical Engineering.
E. A. Pryor—second year, Applied Geology.
H. W. Read—third year, Applied Geology.
S. A. Rose—third year, Metallurgy.
Margaret E. Saddington—third year, Arts.
Joan L. Sawyers—third year, Arts.
Lola B. Sharp—third year, Industrial Chemistry.
B. J. Suters—fourth year, Architecture.
R. J. Turnbull—second year, Commerce.
N. G. Vickery—first year, Commerce.
J. W. Wamsley—third year, Metallurgy.
B. N. Wilson—second year, Commerce.
N. F. Wilson—fourth year, Architecture.
R. C. Wittig—first year, Metallurgy.

Teachers’ College Scholarships

Annette Astridge—first year, Science.
E. F. Baptist—second year, Commerce.
G. O. Barnes—first year, Commerce.
J. E. Bishop—first year, Industrial Arts.
K. Blain—first year, Manual Arts.
Barbara J. Bland—first year, Science.
M. Blumer—first year, Science.
M. D. Broad—third year, Manual Arts.
M. J. Brown—first year, Science.
R. A. Brownsmith—third year, Manual Arts.
R. Bruce—third year, Manual Arts.
B. W. Burton—third year, Manual Arts.
J. C. Cantwell—first year, Science.
Lesley D. Clark—first year, Science.
E. J. Davies—third year, Manual Arts.
R. C. De Grave—first year, Science.
W. F. Delaney—first year, Science.
Pamela Donaldson—first year, Science.
M. Donnelly—first year, Commerce.
B. J. Elliott—first year, Commerce.
R. S. Faggotter—first year, Industrial Arts.
P. J. Farry—first year, Science.
Yvonne A. Ferguson—first year, Science.
J. M. Franklin—first year, Science.
Helen Gordon—first year, Science.
N. C. Gordon—first year, Science.
L. R. Gough—first year, Industrial Arts.
B. G. Graham—first year, Science.
R. C. Gunn—first year, Science.
Catherine Hardie—first year, Science.
Helen D. Hardy—first year, Science.
G. L. Hare—first year, Science.
W. J. Hazleton—first year, Science.
M. M. Hewitt—first year, Science.
Eunice L. Hince—first year, Science.
A. M. James—first year, Commerce.
G. J. Kennedy—first year, Science.
Dianne King—first year, Science.
E. A. Le Breton—first year, Science.
W. Lowery—first year, Science.
Jeanette McFarlane—first year, Science.
J. E. Mackney—third year, Manual Arts.
J. M. Madden—third year, Manual Arts.
A. H. Magnusson—first year, Science.
Teachers' College Scholarships—continued:

P. R. Merry—first year, Industrial Arts.
G. F. Miller—second year, Manual Arts.
N. L. Mitchel—second year, Manual Arts.
W. J. S. Moore—first year, Science.
Marilyn N. Moses—first year, Science.
P. J. Nesbitt—first year, Industrial Arts.
J. R. Nicholls—first year, Commerce.
J. D. Norris—first year, Industrial Arts.
V. J. O'Rourke—first year, Science.
F. L. Poole—first year, Science.
A. H. Rapley—first year, Industrial Arts.
R. J. Read—second year, Manual Arts.
W. H. Reading—first year, Science.
D. O. Robertson—first year, Science.
R. W. Rogers—second year, Commerce.
P. G. Rose—second year, Commerce.
G. J. Russell—first year, Science.
P. G. Saint—third year, Manual Arts.
P. G. Sohlenker—first year, Industrial Arts.
T. P. Seah—first year, Industrial Arts.
G. W. Shearsby—first year, Industrial Arts.
D. A. Simmons—first year, Science.
H. K. Smith—first year, Industrial Arts.
Valma A. Smith—first year, Science.
N. F. Smythe—first year, Science.
G. M. Snodgrass—first year, Science.
C. J. South—first year, Industrial Arts.
P. F. Spillane—first year, Science.
T. A. Summers—first year, Science.
P. M. Swan—first year, Industrial Arts.
J. R. Thorston—first year, Industrial Arts.
L. J. Trimmer—first year, Industrial Arts.
J. L. Varley—first year, Industrial Arts.
J. D. Wetherall—first year, Science.
B. Wheelerham—first year, Science.
J. G. Willis—first year, Industrial Arts.
W. D. Wright—first year, Science.

Newcastle University College

Teachers' College Scholarships

Lynette R. Adamthwaite—first year, Arts.
J. R. Atherton—third year, Arts.
Marie R. Baldwin—first year, Arts.
B. M. Banfield—first year, Arts.
Teachers' College Scholarships—continued:

Irene J. Belford—first year, Arts.
G. R. Bentley—first year, Arts.
S. F. Bourke—first year, Science.
Helen M. Bray—first year, Science.
B. J. Brown—third year, Arts.
Doreen R. Brown—second year, Arts.
Marian E. Brown—second year, Arts.
Judith C. Bullerwell—third year, Arts.
Mary P. Calleen—second year, Arts.
Sandra C. Caskey—first year, Arts.
T. J. Collins—first year, Arts.
D. J. Condon—first year, Science.
Marion M. Crothall—second year, Arts.
Judith A. Davies—first year, Science.
M. O. Davies—third year, Science.
Mary C. Dick—first year, Arts.
K. N. Donald—first year, Arts.
Robyn A. Ellicott—third year, Arts.
Brenda T. Elliott—second year, Arts.
K. J. Eltis—third year, Arts.
R. Finedon—second year, Science.
Kay F. Flanagan—second year, Arts.
Robyn G. Garner—third year, Arts.
J. J. Geary—third year, Arts.
Joy E. Greenwood—first year, Arts.
R. J. Harvey—third year, Science.
C. R. Hawkin—third year, Science.
C. J. Hawkins—second year, Science.
J. A. N. Hearn—third year, Arts.
J. F. Hill—third year, Arts.
Margaret A. Hollis—first year, Arts.
Janice F. Humphreys—second year, Arts.
J. A. Jones—first year, Arts.
R. A. Kelly—third year, Arts.
Yvonne Kraemer—second year, Arts.
Sandra Leggitt—second year, Science.
J. Lightfoot—second year, Science.
K. J. Longworth—first year, Arts.
K. M. Majoribanks—second year, Science.
Maureen Markham—second year, Arts.
R. J. MacDonald—first year, Science.
Margaret E. McDermott—third year, Arts.
Eileen McHugh—third year, Arts.
J. D. McMahon—third year, Arts.
Patricia A. McMahon—first year, Arts.
J. A. Menzies—second year, Arts.
Denise M. Neville—first year, Arts.
P. E. Niland—second year, Arts.
Marianne A. O'Donnell—third year, Arts.
P. G. G. O'Shea—third year, Arts.
R. L. Parker—second year, Arts.
Geraldine E. Pears—second year, Arts.
B. J. Proctor—first year, Arts.
J. M. Quinn—third year, Arts.
K. J. Reynolds—second year, Arts.
Helen J. Rice—second year, Arts.
Robin L. Robertson—third year, Arts.
Kay Rolfe—first year, Arts.
Yvonne Russell—first year, Arts.
G. Spencer—second year, Arts.
Eileen J. Symes—second year, Arts.
Kathleen F. Temple—second year, Arts.
J. J. Thompson—third year, Arts.
P. J. Thomson—first year, Arts.
D. Wickham—second year, Science.
A. J. Wilmot—second year, Science.
E. P. Willmot—second year, Science.
Barbara J. Woolley—second year, Arts.
APPENDIX IV

Degrees Conferred at Kensington on 19th April, 1958

Doctor of Science (honoris causa)
Cobden Parkes, F.R.I.B.A., F.R.A.I.A.

FACULTY OF SCIENCE

Doctor of Philosophy (Ph.D.)

SCHOOL OF APPLIED PHYSICS

SCHOOL OF CHEMISTRY
Raymond Keith Ralph, M.Sc. N.Z.

Master of Science (M.Sc.)

SCHOOL OF APPLIED PHYSICS
Alfred Schwartz, Dipl.Ing. Vienna, A.S.T.C.

SCHOOL OF BIOLOGICAL SCIENCES
John McDougall Armstrong, B.Sc. Syd.

SCHOOL OF CHEMISTRY
Aristole John Costoulas, B.Sc.
Leopold Dintenfass, Dipl.Ing. Lwow.
Thomas Desmond Flynn, B.Sc., A.S.T.C.
Robert Owen Hellyer, B.Sc., A.S.T.C.
Dermott Kevin O’Neill, A.S.T.C.
Hanneke Waterman, B.Sc. Syd.

Bachelor of Science (B.Sc.)

SCHOOL OF BIOLOGICAL SCIENCES
Ronald Victor Buist.
Norman Martin, A.S.T.C.
Basil Patrick McBrien, A.S.T.C.
Andrew Muir, A.S.T.C.
School of Chemistry

Brian Raymond Craven, A.S.T.C. (Honours Class I).
Charles Christian Knispel, A.S.T.C. (Honours Class I).
Keith Gerrard McLaren, A.S.T.C. (Honours Class I).
Frank Brierley Whitfield, A.S.T.C. (Honours Class I).
Gabriel Kornis (Honours Class II).
Bruce Henry Pyke, A.S.T.C. (Honours Class II).
Albert Henry Andrews, A.S.T.C.
Sydney Alfred Anstee, A.S.T.C.
Barry Chiswell.
John Hedley Curtin, A.S.T.C.
Patrick James Donovan, A.S.T.C.
John Joseph Matthew Fardy, A.S.T.C.
Trevor Mark Florence, A.S.T.C.
Harry Gilmore.
Peter Grenville Thomas Griffin.
Alan John Harris, A.S.T.C.
Robert William Humphreys.
Jack Kaufman.
Jeffrey Lionel Kerr, A.S.T.C.
Patrick William Lynch, A.S.T.C.
Sylvester Colin Mills, A.S.T.C.
Denis Edward Noonan.
Richards Rudzats, A.S.T.C.
John Morris Samios.
Keith Hamilton Shaw, A.S.T.C.
John Ellington Steanes, A.S.T.C.
Colin Crosbie Stewart, A.S.T.C.
William Watson Talty, A.S.T.C.

Science

Brian Victor Passmore.

Bachelor of Science (Optometrical Science) B.Sc. (Opt. Sc.)

School of Applied Physics

Richard Henry Cleworth, A.S.T.C.
Kenneth Cyril Royston Herbert, A.S.T.C.
Brian Layland, A.S.T.C.
Peter Albert Micheletti, A.S.T.C.

Faculty of Technology

Doctor of Philosophy (Ph.D.)

School of Chemical Engineering

Noel Alfred Warner, B.Sc.
Francis Leslie Connors, M.Sc., A.S.T.C.
School of Metallurgy
Robert George Robins, M.Sc.

Master of Science (M.Sc.)

School of Chemical Engineering
Mohammad Siddique Choudhry, B.Sc. Panj.
Alban Jude Lynch, B.Sc., A.S.T.C.

School of Metallurgy
Anders John Anderson, A.S.T.C.

School of Mining Engineering and Applied Geology
Lennard Robert Hall, B.Sc. Syd.

School of Textile Technology
Alan Robert Haly, B.Sc. Qld.

Bachelor of Science (B.Sc.)

School of Chemical Engineering
William Pattie Macmillan (Honours Class I and University Medal)
Andrew Colin Kerr (Honours Class I).
Harry James Gorman, A.S.T.C. (Honours Class II).
Harold James Smith, A.S.T.C. (Honours Class II).
Peter Lee Spedding (Honours Class II).
Douglas Ross Symons, A.S.T.C. (Honours Class II).
Klaus Martin Brieger, A.S.T.C.
Ian Glencross Burgess.
Michael Chan Seng Cheong.
Charles David Ezer.
Brian Patrick Fitzpatrick.
Keith Robert Gammie, A.S.T.C.
Arthur Alexander Graham.
John William Neville Greenwood.
Arthur Robert Harris, A.S.T.C.
Hans Lamens.
William John McMaugh, A.S.T.C.
Charles Geoffrey Noller.
Peter Kingsman Roberts, A.S.T.C.
Soeparwadi.
Malcolm Leonard Somers, A.S.T.C.
Alan Keith Stimson, A.S.T.C.
Trevor John Thorburn, A.S.T.C.
Robert Grant Worrall.
Department of Food Technology

Otto Boedihardjo (Honours Class II).
Graeme Walton Berman, A.S.T.C.
Peter Maxwell Crocker, A.S.T.C.
Walter Roy Day, A.S.T.C.
John Vinson Dossetor.
Dick Nasserie.
Lloyd Herbert Walker, A.S.T.C.

School of Metallurgy

Campbell John Cripps Clark (Honours Class I).
Anthony Samuel Malin (Honours Class I).
Graeme Beresford Guest (Honours Class II).
Jack Stanley Aggett, A.S.T.C.
David Lindsey Bryant, A.S.T.C.
Terence Robert Cartwright, A.S.T.C.
James Mervyn Chie, A.S.T.C.
Beresford Christopher Moor, A.S.T.C.
Graham Leonard Fraser Powell, A.S.T.C.

School of Wool Technology

Brian Keith Davis (Honours Class II).
Terence John Grainger.
Richard John Hart.
Peter Aloysius McInnes.

Bachelor of Engineering (Geology) B.E. (Geol.)

School of Mining Engineering and Applied Geology
Ian Powell Brown (Honours Class II).
Robert Cleland McEwen (Honours Class II).

Bachelor of Engineering (B.E.)

School of Mining Engineering and Applied Geology
Errol Christopher McDonald (Honours Class I).
Noel Francis Owers.
Thambipillai Sivagnanam.

Faculty of Engineering

Doctor of Philosophy (Ph.D.)

School of Civil Engineering
SCHOOL OF MECHANICAL ENGINEERING
Gabriel Tibor Csanady, Dipl.Ing. Munich.

Master of Engineering (M.E.)

SCHOOL OF CIVIL ENGINEERING
Paul William Ryan, A.S.T.C.

SCHOOL OF MECHANICAL ENGINEERING
Kurt Weiss, Dipl.Ing. Vienna.

Bachelor of Engineering (B.E.)

SCHOOL OF CIVIL ENGINEERING
John Edward Winton (Honours Class I).
Graeme Alexander Kennedy (Honours Class II).
Emmett Michael O'Loughlin (Honours Class II).
Ernest James Armstrong.
David Neil Body, A.S.T.C.
Tai Choong Chou.
Anthony Joseph Condon.
John Phillip Downey.
Thomas Eng Siew Gan.
William Richmond Hazell.
Kenneth Richard Hillier.
William Harry Glennie Holmes.
Kevin Charles Howard.
Peter Edwin Jessop.
Gordon Ronald Johnston.
James Robert Jones.
Peter George Jones.
John Kendall Knight.
Ian Peter MacPherson.
Donald William Marr, A.S.T.C.
Colin Robert Parr.
Michael Randoja.
Kenneth Wilmot Riding, A.S.T.C.
Rodney James Slater.
Alexander Robertson Stuart.
Jeno Frank Toppler.
Kusta Vesilo, A.S.T.C.
Brian Godfrey Wenham.
SCHOOL OF ELECTRICAL ENGINEERING

Brian Gilbert Leary, A.S.T.C. (Honours Class I).
Thomas Maxwell Eldridge (Honours Class II).
Kevin Gerald Gately (Honours Class II).
David Griffith Graham (Honours Class II).
Geoffrey Ainsworth Ivers (Honours Class II).
John Hunter Jones (Honours Class II).
David Keith Macnab (Honours Class II).
Arthur Brian McDermott (Honours Class II).
Dennis James McLennan (Honours Class II).
Peter Douglas Mudd (Honours Class II).
John Leonard Stewart (Honours Class II).
Henry Waldon Atkinson.
Geoffrey Arnold Chandler, A.S.T.C.
David Andrew Clark.
Ian MacDonald Clark, A.S.T.C.
Darryl Ashley Drake.
Robert Lee Edmunds.
Xavier Khen Wah Goh.
Raymond John Maino.
James Laurence Moloney.
Sheung Yee Pok.
Kiah Tong Tan.
James Tomes Wade.
Robert Eric Wallyn.
Douglas Robert Woodman.
Robert Forbes Young.

SCHOOL OF MECHANICAL ENGINEERING

Vaclav George Kolsky (Honours Class II.)
Stanley Samsa (Honours Class II).
Alistair Stuart Bowman.
Joseph Frank Brook.
Theodore Arthur Crowley, A.S.T.C.
David Frederick John Ellison.
William Lindsay Grimshaw, A.S.T.C.
Ernest Henri Emile Halewijn.
Alexander Michael Mathew.
Eric William Thomas Pierce, A.S.T.C.
John Harold Pierce.
John Henry Planner, A.S.T.C.
Leonard John Salkeld.
Ian Keith Spence.
Stanley Seddon Stokes, A.S.T.C.
John Frederick Whatham, A.S.T.C.
FACULTY OF ARCHITECTURE

Bachelor of Architecture (B.Arch.)

SCHOOL OF ARCHITECTURE AND BUILDING
Stuart Edmond Behne (Honours Class II).
Edwin Chin Tan Chan (Honours Class II).
Barrie Lawrence Drake (Honours Class II).
George Gordon Fuller (Honours Class II).
George Statzenko (Honours Class II).
Edward Carrington Mack.
George Barry Stone.

Degrees Conferred at Newcastle University College on
21st March, 1958

FACULTY OF SCIENCE

Doctor of Philosophy (Ph.D.)

SCHOOL OF APPLIED PHYSICS

Master of Science (M.Sc.)

SCHOOL OF CHEMISTRY
Robin Carol Irwin, B.Sc.N.E.

Bachelor of Science (B.Sc.)

SCHOOL OF CHEMISTRY
John Barry Henderson, A.S.T.C. (Honours Class I).
Thomas James Batterham, A.S.T.C. (Honours Class II).
Neville Russell Foster, A.S.T.C.
Eric Francis Palmer, A.S.T.C.
Peter Charles Taylor.

SCIENCE
Janet Ruth Donaldson.
John Terrence Flanagan.
George Maxwell Rogers.
Barry Edgar Williams.
Lloyd Williams.
FACULTY OF TECHNOLOGY

Bachelor of Science (B.Sc.)

School of Chemical Engineering
Jeffrey Allen Dann, A.S.T.C. (Honours Class I).
Gordon Mowbray, A.S.T.C. (Honours Class II).
John Roberts, A.S.T.C. (Honours Class II).
Brian David Henry.

School of Metallurgy
Wesley Callender, A.S.T.C.
Reginald Beres Halsey, A.S.T.C.
Douglas Clive Harris, A.S.T.C.
Albert William Shearer, A.S.T.C.
David Henry Skinner, A.S.T.C.
John Allan Uhrig, A.S.T.C.
Ramsey Moore Wheeler, A.S.T.C.

FACULTY OF ENGINEERING

Bachelor of Engineering (B.E.)

School of Civil Engineering
Keith Smedley Sellick, A.S.T.C. (Honours Class II).
John Stanton Waddell, (Honours Class II).
Harold Edward Bofinger
David Armstrong Evans.
Miroslaw George Gorbunow.
Aubrey Gavin Newman.

School of Mechanical Engineering
Geoffrey Donald Butler, A.S.T.C. (Honours Class II).
David James Melville.

DEPARTMENT OF ARTS
The degree of Bachelor of Arts of the University of New England was conferred on the following students of the Newcastle University College:

Donald Clarence Laycock (German—Honours Class I) (English—Honours Class II, Division 1).
James William Hemmings (Economics—Honours Class II, Division 1).
Winston Gregory McMinn (History—Honours Class II, Division 1).
John Gill (Economics—Honours Class II, Division 2).
Fay Griffiths (German—Honours Class II, Division 2).
Colette Ormonde (English—Honours Class II, Division 2).
Eileen May Bilbie.
Edwin John Braggett.
Sandra Joan Clarke.
Thea Catherine Frith.
Lloyd Ronald Gledhill.
Margaret Anne Hennessy.
Arthur Thomas Howland.
Margaret May Kennedy.
Pamela Mary Logue.
Paul Alexander McLean.
Julia Fay Nixon.
Ross Robinson.
Nola Beverley Thomas.
Ernest Harrison Williams.

Degrees conferred other than at Graduation Ceremonies

_Doctor of Philosophy (Ph.D.)_

_School of Chemistry_

_Master of Science (M.Sc.)_

_School of Chemical Engineering_

_School of Chemistry_

_Master of Engineering (M.E.)_

_School of Civil Engineering_

_Master of Architecture (M.Arch.)_

_School of Architecture and Building_
Anita Barbara Greenslade, B.Arch. (conferred 11th November, 1957).

_Newcastle University College_

_Master of Science (M.Sc.)_

_School of Chemical Engineering_
APPENDIX V

Research Activities

The following projects were conducted in the various Schools of the University in 1957-58:

School of Applied Physics

(a) As a requirement for the degree of Doctor of Philosophy:
   (i) Nuclear magnetic relaxation—L. O. Bowen.
   (ii) Mass spectrometers of high sensitivity for the intermediate mass range—L. A. Cambey.
   (iii) Some aspects of ocular dominance—J. Lederer.
   (iv) Some aspects of visual space perception—G. Amigo.
   (v) Physical aspects of the magnetism of rocks—L. G. Parry.
   (vi) Molecular structure determination by X-ray diffraction—J. Bevan.

(b) As a requirement for the degree of Master of Science:
   (i) Development of high temperatures by use of solar radiation—J. E. Guitronich.
   (ii) Electronic techniques applied to spectroscopy—W. G. Walker.
   (iii) The stabilisation and scanning of magnetic fields by nuclear resonance—K. H. Marsden.
   (iv) Physiological and clinical aspects of flicker fusion—C. R. Brown.
   (v) Diurnal and climatic variations of solar brightness—J. B. Webster.
   (vi) Some aspects of the process of fracture in glass—J. W. Ziegler.
   (vii) Ultrasonic devices applied to welding—V. J. Manners.
   (viii) Numerical solutions of problems of neutron diffusion and radiative transfer—J. L. Cook.
   (ix) Some applications of electronic techniques to high resolution spectroscopy—J. E. Cleary.
   (x) Nuclear magnetic spectroscopy—E. Laisk.

(xii) Control of the temperature attained in a solar furnace—K. Mann.

(c) Other Projects:

(i) Development and construction of solar furnaces at Broken Hill (jointly with Zinc Corporation Ltd.) and Sydney (jointly with Ralph Symonds Pty. Ltd.).

(ii) Researches on vapour pumps and ultra-high-vacuum devices.

(iii) Transistorised and miniaturised nucleonic apparatus.

(iv) Study of wool fibres by X-ray diffraction.

(v) Optical properties of multilayer films.

(d) Publications:


SCHOOL OF CHEMISTRY

Department of Physical Chemistry

(a) As a requirement for the degree of Doctor of Philosophy:—

Studies in chemical kinetics of gaseous reactions: The pyrolysis of chlorinated hydrocarbons—E. S. Swinbourne.

(b) Other projects:—

(i) A new method for the measurement of the thermal conductivity of liquids.

(ii) Study of the harmonic spectrum produced by liquids on the application of a sinusoidal field.

(iii) The application of statistical correlation and regression methods to the treatment of chemical data.

(iv) The construction of apparatus for analysis by the technique of gas chromatography.

(v) Radiation chemistry of organic systems.

(vi) Radiation chemistry of cellulose and wood.

(vii) Exchange reactions of isotopic hydrogen with organic substrates.

(viii) Analytical reactions of naphthalene derivatives with emphasis on fluorometric effects.

(ix) Further studies with the electron microscope have been carried out on the bacteria *Serratia marcescens*.

(x) An investigation of fungal hyphae using disintegration and ultrasectioning techniques.

(xi) The Pyrolysis of Chlorinated Hydrocarbons. Lecture presented by E. S. Swinbourne to N.S.W. University of Technology Chemical Society, 30th October, 1957.

(xiii) Tritium in Research. Lecture given by J. L. Garnett to the staffs of C.S.I.R.O., Canberra, and the Australian National University, Canberra.

(c) Publications:


*Department of Analytical Chemistry*

(a) As a requirement for the degree of Master of Science:

(i) Differential spectrophotometric methods in the analysis of tin, lead and antimony alloys—R. A. Wearne.

(ii) Studies in emission spectrography—E. S. Sharkey.

(b) Other projects:

(i) Acid-base equilibria in substituted aromatic compounds.

(ii) Amperometric investigations of precipitation reactions.

(iii) Stability constants of metals with heterocyclic bases and their relation to dissociation exponents.

(iv) The determination of magnesium in cast iron by separation on a paper column and estimation with E.D.T.A.
(a) As a requirement for the degree of Doctor of Philosophy:
   (i) Crystal structure of cyclo-octadiene palladium chloride—E. C. Watton.
   (ii) The relation between structure and infra-red absorption of metal complexes—W. T. Oh.
   (iii) Volatile nitrogen containing inorganic fluorides—I. K. Gregor.
   (iv) The crystal structure of some complexes of platinum and palladium—N. C. Stephenson.

(b) As a requirement for the degree of Master of Science:
   (i) The preparation, properties, and structure of new types of transition metal oxy-acid complexes—E. Kokot.
   (ii) Studies on phenanthroline type complexes of Group IB Metals—N. T. Barker.
   (iii) An investigation of the structure of some complexes containing Group VIII metals—T. N. Lockyer.
   (iv) Complexes of metals of Group VIII and Group IB with ligands containing sulphur and arsenic—B. Chiswell.
   (v) Stereochemistry of complexes of nickel—Miss T. Christie.
   (vi) The crystal structure of copper formate—C. H. L. Kennard.
   (vii) The crystal structure of a metal complex—P. Correy.

(c) Other projects:
   (i) The chemistry of vanadium in its lower valency states.
   (ii) Use of radio-isotopes in the study of metal complexes.
   (iii) The formation of complexes containing six-covalent palladium (II) and platinum (II).
   (iv) Investigations of the infra-red spectra of co-ordination compounds.
   (v) Spectrophotometric studies in the visible and ultra-violet regions of metallic complexes in aqueous and non-aqueous solvents.
   (vi) Investigations into the chemistry of titanium (III).
   (vii) Investigation of magnetic isomers of bivalent nickel complexes.
   (viii) Nitrogenous chelate complexes of transition metals.
(ix) Magnetochemistry of complex fluorides.

(x) Magnetic investigations into polynuclear complexes.

(xi) Transition metal complexes with diazoaminobenzene.

(xii) Co-ordination compounds of transition metals with chelate compounds of sulphur.

(xiii) Determination of the crystal structure of co-ordination compounds by X-ray diffraction.

(xiv) The use of a tetra-arsine as a ligand in complex salts.

(d) Publications:—


Department of Organic Chemistry

(a) As a requirement for the degree of Doctor of Philosophy:
   (i) Synthesis of biologically important derivatives of inositol—M. E. Tate.
   (ii) Oxidation processes in organic chemistry—E. R. Cole.
   (iii) The chemistry of ants—D. L. Ford.
   (iv) Studies in the chemistry of carbonyl compounds—D. H. Solomon.
   (v) Studies in the pyrimidine field—R. N. Warrener.
   (vi) Chemistry of ant extractives—Miss H. Hinterberger.
   (vii) The chemistry of emmolic acid and related synthetic studies—G. Kornis.
   (viii) Synthesis in the nucleic acid field—R. Naylor.

(b) As a requirement for the degree of Master of Science.
   (i) Some oxidations with lead tetra-acetate—H. E. Barron.
   (ii) Triterpenes from the latex of Ficus Spp.—C. J. Miller.
   (iii) The sapogenins of Emmenospermum Alphitonioides—H. V. Simes.
   (iv) The chemistry of castanogenin—Miss B. J. Stevenson.
   (v) An investigation of the Dakin reaction and its applications—K. E. Whichello.
   (vii) The chemical properties and tanning characteristics of the bark of Ceriopos roxburghiana—D. Ghosh.
   (viii) Stereochemical studies in the inositol series—Mrs. V. J. Bender.
   (ix) Oxidation of phenoxazine and related compounds—M. J. Lamond.
   (x) Tannins of Eucalyptus redunca—B. C. Player.
   (xi) Pyrimidine derivatives of end-groups in proteins and peptides—J. H. Taylor.
   (xii) The phenolic constituents of Castanospermum australe—I. Salasoo.

* 54990—20 K5137 609
(c) Other projects:—
(i) The sapogenins of *Ternstroemia cherryi*.
(ii) The saponins of some New Guinea *Sapindaceae*.
(iii) Chemistry of *Albizia xanthoxylon*.
(iv) Synthesis of pyrimidine nucleosides and deoxynucleosides.
(v) Preparation of inositol phosphates.

(d) Publications:—


(b) As a requirement for the degree of Master of Science:

(i) Substitution of square planar complexes—G. C. Curthoys.


(iii) Determination of strontium-90 in biological materials—P. Davis.

(iv) Radiotracer studies of protective coatings on metals—K. G. McLaren.

(c) Other projects:

(i) Exchange and radiation-induced exchange between iodine and amyl iodide in pentane.

(ii) Radiation synthesis of urea.

(iii) Nuclear chemistry of selenium in neutron activation reactions.

(iv) Variations with temperature and moisture of the phosphate uptake by plants.

(d) Publication:


SCHOOL OF CHEMICAL ENGINEERING

(a) As a requirement for the degree of Doctor of Philosophy:

(i) An investigation of the extraction and simultaneous purification of uranium compounds from ores—R. E. C. Beattie.

(ii) Studies in the industrial processing of polyvinyl chloride—F. L. Connors.

(iii) Kinetic studies in the oxide-carbide-silicide systems of uranium and thorium—B. Craven.

(iv) Studies of refractory materials containing uranium and thorium oxides—H. Fowler.

(v) Some studies relating to laminated phenolic plastics—F. O. Howard.

(vi) Studies of the properties of boiling sodium—T. L. Judell.

(vii) Studies in heat transfer and sublimation at low pressures—J. R. Norman.
(viii) Investigation into the thermal shock resistance of uranium and thorium ceramics—R. O. Prince.

(ix) The steady state chlorination of the chloroethanes—J. S. Ratcliffe.

(x) The development of fluorination processes—J. D. Smith.

(xi) Studies in ion-exchange and absorption—P. Souter.

(xii) A study of aerosol and gaseous pollution in New South Wales—J. L. Sullivan.

(xiii) Absorption of zinc vapour in molten lead—N. A. Warner.

(b) As a requirement for the degree of Master of Science:

(i) A study of scale growth in processing equipment in the sugar industry—D. R. Golightly.

(ii) The copolymerisation of acrylic esters—J. K. Haken.

(iii) Studies of a pulse column system for liquid-liquid extraction—J. R. Harry.

(iv) An investigation of the performance and design of the convection banks of tube-still furnaces—P. Huggins.

(v) Studies in the fluidised conversion of gypsum to its dehydration products—C. H. Hunt.

(vi) Electrochemical fluorination of heterocyclic compounds—B. G. Madden.

(vii) The application of optical methods to crystal nucleation and growth—C. Samways.


(c) Other Projects:

(i) Atmospheric pollution in New South Wales industrial areas.

(ii) Automatic process control.

(iii) Effect of gamma radiation on surface coatings.

(iv) Chemical process simulation.

(v) Evaluation of surface coatings.

(vi) Gasification of high sulphur coal.

(vii) Removal of organic sulphur from coal gas.

(viii) The development of coal-based chemical and liquid-fuel industries.

(ix) The use of thermosetting ethoxylamine resins in bone surgery.
(d). Publications:—


Department of Food Technology

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) A study in dehydration—V. K. G. Hatwalne.

(b) As a requirement for the degree of Master of Science:—

(i) Retention of colour in tomato concentrates—R. A. Edwards.

(ii) Effect of radiation on the physical and chemical properties of Australian Wheats—I. McK. Norris.

School of Metallurgy

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) The measurement and interpretation of the viscosity of metals—A. J. Anderson.

(ii) The effect of deformation inhomogeneities on preferred orientations—M. Hatherly.

(ii) Metal-mould reactions with respect to casting titanium—J. W. F. Hitchon.

(iv) Mass transfer between molten metals and fused salts—F. Lawson.

(v) Solid-gas reactions at high temperatures with particular reference to the oxidation of metals—G. R. Wallwork.

(b) As a requirement for the degree of Master of Science:—

(i) The effect of "barriers" such as slip lines, deformation bands and low angle boundaries on the propagation of martensite plates—T. W. Barnes.

(ii) A study of gas-metal reaction kinetics—S.E. Coalstad.
(iii) Studies of equilibria between gases and liquids at elevated temperatures—C. J. Cripps Clark.

(iv) The reduction of oxides and other compounds to metals with special reference to the selective reduction of iron (and phosphorous) from slags of appreciable iron and manganese content—J. A. Gregory.

(v) Study of the composition of uranium alloy powders—G. B. Guest.

(vi) A physico-chemical study of the solution of interstitials in metals—B. Harris.


(ix) Crystallographic relationships in the bainite transformation in steels—N. F. Kennon.

(x) The preparation and properties of silicon carbide—L. H. Keys.

(xi) The technical development and prospects of the Australian copper industry—L. A. Lyons.

(xii) Deformation of body centered cubic metals—J. E. McLennan.

(xiii) The determination of the homogeneous and inhomogeneous strains accompanying the martensitic transformation in medium carbon steels—P. G. McDougall.

(xiv) A study of the relief phenomena and crystallographic relationships accompanying the cubic to tetragonal transformation in the alloy CoPt—A. S. Malin.

(xv) Some aspects of the gaseous reduction of iron oxides with particular reference to the utilization of fine Australian iron ores—V. J. Moran.

(xvi) An investigation of the technological potentialities of levitation melting—E. G. Price.

(xvii) An investigation of some of the factors affecting the welding of titanium—J. M. Newburn.

(c) Other Projects:

(i) Crystallographic relationships in the cubic to orthorhombic transformation in AuCu.

(ii) Gas-solid reaction kinetics.
(iii) The desilverization of lead bullion.
(iv) The electro-refining of thorium.
(v) Drossing rate of high purity lead— influence on the drossing rate by impurities.

(d) Publication:—


SCHOOL OF MECHANICAL ENGINEERING

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) Experimental studies of drying grain under conditions of low heat input—J. R. Allen.

(ii) An investigation of pressure-wave phenomena in exhaust pipes of an internal combustion engine—S. E. Bonamy.

(iii) The determination and evaluation of design data for rubber components under shear, compressive and complex loading systems—A. J. Carmichael.

(iv) The low frequency electric induction furnace—N. Cooke.

(v) Some theoretical studies of neutron distributions in various reactor systems—D. Magnusson.

(vi) Dispersal of dust particles from industrial stacks—G. T. Csanady.

(b) As a requirement for the degree of Master of Engineering:—

(i) Practical problems associated with printing block surfaces—H. A. Borchardt.

(ii) The design construction and experimental testing of a high-pressure quick-steaming boiler—K. R. Bridger.

(iii) Determination of the mechanical losses due to the bending of wire ropes over sheaves under load—E. C. Hind.


(vi) An investigation into the performance of grain augers—A. W. Roberts.
Further applications of the gas dynamics analogy—G. Saiva.

An analysis of motor vehicle exhaust systems—R. W. Upfold.

Design of solar water heaters from predictions of global radiation and some observations on performance—C. M. Sapsford.


(c) Other Projects:—

(i) Philosophical studies in kinematics of mechanisms.
(ii) Field experiments in tillage practice.
(iii) Performance of grain augers.
(iv) Pneumatic conveying of grain.
(v) Performance of spinner broadcasters.
(vi) Performance of low-volume spray nozzles.
(vii) Mechanics of metal cutting.
(viii) Telemeter for flood forecasting.
(ix) Unsteady effects in turbo machines.
(x) Performance of fluid couplings.
(xi) Loss coefficients of Australian pipe fittings.
(xii) Wind pressure distribution on buildings.
(xiii) Bow shock wave detachment distances.
(xiv) Aerofoil theory.
(xv) Flow past porous and slotted walls.
(xvi) Flow of jets.
(xvii) Aerodynamics of swept back wings.
(xviii) Mathematical methods.
(xix) Reactor engineering and physics.

(d) Publications:—


**SCHOOL OF ELECTRICAL ENGINEERING**

(a) As a requirement for the degree of Doctor of Philosophy:


(b) As a requirement for the degree of Master of Engineering:

(i) The impulse testing of transformers and associated phenomena—E. G. Williams.

(ii) The application of electronic techniques to metrology—H. A. Ross.

(iii) The application of magnetic non-linearity to digital computer components—R. G. Smart.

(iv) Some aspects of magnetic amplifiers—B. S. Omelchuck.

(v) A transistor-operated frequency standard—G. J. Parker.

(vi) Design of protective fittings for string insulators—E. Buckler.

(viii) Grid-circuit distortion in low-bias audio-frequency vacuum tube amplifiers—E. Watkinson.

(ix) Application of the digital computer to the study of aerial problems—G. Karoly.

(x) Criteria for impulse testing of video systems—A. F. Smith.

(xi) Analysis of the impulsive response of systems and means for preserving the response during computation—R. G. Wenham.

(xii) The development of a special purpose digital computer using transistors—H. L. Humphries.


(xiv) Application of logical circuits to the sorting reduction and processing of controlled data—J. A. Dembecki.

(xv) Electronic analogue simulation of nuclear reactor—P. J. Gillespie.

(xvi) Pulsating permeance of air gaps—D. T. Nightingale.

(xvii) A synchronous machine analogue—C. O. Johnstone.

(xviii) Three new measuring spark gaps and the development of means for their calibration—L. Medina.

(xix) Servomechanisms with non-linear damping—O. Pawloff.

(c) As a requirement for the degree of Master of Science:—

(i) Speed control of squirrel cage induction motor—G. W. G. Thomas.

(d) Other Projects:—

(i) Extension of the electronic analogue computer UTAC and the development of a new drift corrected computing amplifier.

(ii) The construction of a simulator to facilitate the design of nuclear reactors.

(iii) Development of an electrical analogue for a synchronous machine.

(iv) Development of recurrent surge generator.

(v) Network synthesis by means of the digital computer.

(vi) Automatic solution to load flow and transient conditions on power systems.
(vii) Motor design using high speed digital computers.

(viii) Mechanical cross and auto-correlator intended for processing system responses available as graphic plots.

(ix) Electronic correlator incorporating a magnetic tape delay and storage system.

(x) White noise test equipment for servomechanisms and acoustical systems.

(xi) Magnetic amplifier type oscillator.

(xii) Development of equipment for the School's servomechanism laboratory.

(xiii) Aerial field pattern measurements by means of models.

(xiv) The transient response of loudspeakers.

(xv) The measurement of balanced impedances at very high frequencies.

(xvi) An experimental tractor which will follow a draftsman's pencil line at constant forward speed is being developed, for the purpose of investigating the automatic control of two-dimensional cutting processes, such as engraving, profile cutting, cloth cutting and wood working.

(xvii) Analysis of a non-linear R.C.L. Circuit.

(xviii) A magnetic tape delay: for use in synthesis and correlation studies.

(e) Publications:—


SCHOOL OF MINING ENGINEERING AND APPLIED GEOLOGY

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) The physical properties of coal influencing the beneficiation of fine coal—R. G. Burdon.

(ii) The origin, mineralogy and some physical properties of the commercial clays of New South Wales—F. C. Loughnan.

(iii) Coal carbonisation in fluidised beds—K. S. Basden.

(iv) Geomorphology of part of the coastal region of New South Wales—W. E. Geyl.

(v) The evolution and mineralogy of the Cobar metallogenetic province—E. O. Rayner.

(b) As a requirement for the degree of Master of Science:—

(i) The importance of geophysical methods using vertical variometer in the exploration of zircon-rutile deposits—P. Coss.

(ii) The geology of the Lake Cargellico-Rankin Springs district with special reference to underground water resources—K. Griffin.

(iii) Contact metamorphic and pyrometasomatic mineralization at Mt. Tennyson, Yetholme—D. R. Pinkstone.

(iv) Stratigraphic use of the permian foraminifera—G. Rose.

(v) The southern extension of the upper coal measures from Newcastle—J. McGarry.

(vi) The stratigraphy and structure of the Cessnock-Denman area and their relation to the evolution of the Cumberland basin—J. Stuntz.

(vii) Coal seams of the lower coal measures and their structure in the vicinity of the Muswellbrook anticline—J. B. Robinson.

(viii) Near shore sand movement and the maintenance of beach equilibrium—P. J. McKenzie.

(c) Other Projects:—

(i) A working theory of geology and the geological sciences.

(ii) Structural studies in the Cobar, Bourke, Nyngan area.

(iii) Possible structural and stratigraphical accumulation of petroleum in Eastern Australia.
(iv) Investigations of the physical properties and petrographic features of building sandstones.

(v) Investigations in the isolation of montmorillonite and halloysite.

(vi) Investigation of the mineralogy of the commercial dyke clays.

(vii) Chemical structure and mechanism of the formation of hinsdalite.

(viii) Occurrence and beneficiation of monazite in beach sand.

(ix) Beneficiation of fine coal by froth flotation.

(x) Geobotanical investigations at Yerranderie, New South Wales.

(xi) Beneficiation of cassiterite from the Northern Territory.

(xii) Investigations into bonding forces in alumino silicate minerals.

(xiii) Investigation of the white chlorite deposits at Cobargo, New South Wales.

(xiv) An investigation of a rapid technique for the determination of cation exchange capacity of clays and soils.

(xv) An investigation into the nature, properties and possible uses of chars produced by low temperature fluidised carbonisation.

(xvi) Gasification and combustion of chars and high sulphur coals in cyclone furnaces with liquid slag removal.

(xvii) Hydrothermal metasomatism of granitic rocks near Cobargo.

(xviii) Hydrodynamics and petroleum accumulations.

(d) Publications:


SCHOOL OF CIVIL ENGINEERING

(a) As a requirement for the degree of Doctor of Philosophy:
   (i) Shear strength of concrete beams—A. S. Hall.
   (iii) Ultimate flexural strength of prestressed concrete beams—H. J. Brettle.

(b) As a requirement for the degree of Master of Engineering:
   (i) Shear strength of prestressed concrete beams—R. S. Warner.
   (ii) Analysis and application of thin concrete slabs prestressed in two directions—P. S. Balint.
   (iii) Photo-elastic methods for the investigations of stresses in soils—A. G. Douglas.
   (iv) Some aspects of shear resistance of laminated blackbutt—J. L. Jenkins.
   (v) Investigations into electro-chemical hardening of soils, and its effect upon shear characteristics—A. F. S. Nettleton.
   (viii) Improved methods of urban drainage design—I. R. Wood.
   (ix) Improved methods for the design and construction of farm ponds—J. R. Burton.
   (x) Estimation of flood flow on small rural catchments—G. Coulter.
   (xi) Adequacy of hydrologic data in New South Wales—J. R. Learmonth.
   (xii) Improved methods for the synthesis of unitgraphs in flood estimation of a catchment—E. M. Laurenson.
   (xv) Bond in prestressing wires—K. A. Faulkes.

(xvii) Shear strength of continuous prestressed concrete beams—A. Crimp.


(xix) Improved methods of ground control for photogrammetric work—D. C. O'Connor.

(xx) Behaviour of materials and structures at high rates of strain—P. W. Throsby.

(xxi) Ground water resources of the Upper Hunter Valley, New South Wales—W. H. Williamson.

(xxii) Design of concrete mixes for workability—T. C. Randall-Smith.


(xxiv) Factors affecting the immobile water content in concrete bleeding—L. V. O'Neill.

(xxv) Buckling of reinforced concrete—T. Jumikis.

(c) As a requirement for the degree of Master of Science:—

The water requirements of lucerne under irrigation in the Riverina area—D. J. Guyatt.

(d) Other projects:—

(i) Methods of urban drainage design.

(ii) Relationship between rainfall and run-off on small experimental catchments.

(iii) Engineering aspects of “Water Harvesting” and “The Keyline Plan”.

(iv) Use of electronic digital computers in solution of hydrologic problems.

(v) Analysis of Australian storms for depth duration area data.

(vi) Water requirements of crops.

(vii) The use of plastic membranes for the sealing of small dams.

(viii) Review of hydrologic applications of telemetry.
(ix) The efficacy of land treatment on water conservation and flood mitigation.

(x) Hydraulics of water supply lines.

(xi) Scour outlets of lined channels.

Structures
(i) Methods of measuring strains in reinforced concrete.
(ii) Stress relaxation in prestressing wires.
(iii) Strength of hooks in reinforced concrete.
(iv) Stresses in deep beams.
(v) The analysis of slabs.
(vi) Stress distribution around tunnels of different shape.
(vii) Analysis of a fix ended arch rib used for large tunnels.
(viii) The carrying capacity of fillet welds subject to combined bending and shear.
(ix) The effect of point loads and pad loads in the stress distribution in beams.
(x) Gelatine as an elastic material.
(xi) The determination of the probability of failure in service from the strength of test samples.

Soil Mechanics
(i) Seepage conditions for various types of filter.

Concrete Technology
(i) Fines in concrete—the effect of inert and pozzolanic fillers on concrete properties.
(ii) Concrete mix design.
(iii) Methods of testing concrete durability.
(iv) Light weight aggregate for concrete.

(e) Publications:—


School of Wool Technology

(a) As a requirement for the degree of Doctor of Philosophy:

(i) A study of dental attrition in sheep—C. L. Goldstone.

(ii) Practical application of methods of selection promising to yield the greatest improvement in Merino productivity—E. M. Roberts.

(iii) Development of an oesophageal fistulae technique for pasture intake studies with freely grazing sheep—W. McManus.

(b) As a requirement for the degree of Master of Science:

(i) (a) An investigation of the representativeness of the Merino fleece for certain economic traits—G. Scott.

(b) A comparison of the estimation of clean fleece weight by three methods—G. Scott.

(ii) Estimation of economically important genetic and environmental parameters in Corriedale sheep—D. B. Hughes.

(iii) (a) The estimation of phenotypic and genetic parameters in the Australian Romney—J. P. Kennedy.

(b) An investigation of the inter-relationships and inheritance of wool production, wool quality and lamb production, etc., in a flock of medium wool Merino sheep—J. P. Kennedy.

(iv) The determination and analysis of relative economic values of characters considered in the appraisal of wool—J. N. Skinner.

(c) Other projects:

(i) An investigation of the stud organisation and productivity of the Polwarth breed.

(ii) An investigation of the relative economic value of various body traits in the Australian Merino.

(iii) A study of the inheritance of productive features in two Merino flocks in Southern New South Wales.

(iv) Grazing management studies in Merino sheep. (In conjunction with the Division of Plant Industry, C.S.I.R.O., Canberra.)

(v) An investigation of the practicability of the determination of scoured yield of bailed wool by the core boring procedure.

(vi) The application of fleece measurement to the Merino Industry through the medium of flock testing. An operational research approach to the problem of increasing Merino wool production through selection.
(vii) The analysis of a survey of the relative economy of Merino wool types in various areas of New South Wales.

(viii) The inheritance of polledness in, and the productivity of, polled Merino sheep.

(ix) An investigation of phenotypic and genetic parameters in the Roseworthy flock of South Australian Merinos. (In conjunction with Roseworthy Agricultural College, South Australia).

(x) The efficient use of digital computers in the analysis of mass biological data.

(d) Publications:—


(iii) Sheep and Wool Research in the School of Wool Technology. P. R. McMahon, Conference of Sheep and Wool Research Officers, Hawkesbury, Mimeograph, June, 1958, P. 16b. 1.

(iv) Seasonal Pasture Production in Relation to Seasonal Wool Production. J. D. McFarlane, *Wool Technology*, 1957, 4, 2, 73.


School of Mathematics

(a) As a requirement for the degree of Doctor of Philosophy:—
   (i) A study of fluid flow past porous barriers and surfaces—A. H. Low.
   (ii) The vibrations of rotating tapered twisted blades—B. S. Thornton.
   (iii) Studies in the theory of thermal neutralisation—M. H. McKay.

(b) As a requirement for the degree of Master of Science:—
   (i) Wave propagation in a stratified medium—B. E. Clancy.
   (iii) Problems in electromagnetic levitations and heating—W. Brisley.

(c) As a requirement for the degree of Master of Engineering:—
   (i) Some technological applications of the flow of fluids through porous media—I. L. Rose.

(d) Other projects:—
   (i) The distribution of the $\chi^2$-goodness of fit criterion from continuous distributions, with and without estimation (associated with numerical work on UTECOM).
   (ii) The fitting of contagious distributions.
   (iii) The protein-fat ratio in hormone implanted fat lambs.
   (iv) Sampling methods for non-homogeneous small particles.
   (v) Consultative assistance of a statistical nature has been given with reference to the following topics:—
       Curve fitting (Applied Chemistry).
       Multiple regression (Wool Technology).
       Analyses of variance (Wool Technology).
       Nitrogen penetration in welds (Metallurgy).
       Failure of laminated beams (Civil Engineering).
       Design of agricultural trials (Mechanical Engineering).
       Fibre strengths (Textile Technology).
       Design of seed germination experiments (Wool Technology).
       Traffic surveys (Traffic Engineering).
(vi) In connection with the research work of this and other Schools of the University, the following topics have been the subject of work by the Computation Laboratory:

- Components of variance in spinning (Textile Technology).
- Column diffusion (Metallurgy).
- Fourier syntheses and structure factors (Applied Chemistry).
- Distribution of $\chi^2$ (Mathematics).
- Fitting of contagious distributions (Mathematics).
- Fluid coupling (Mechanical Engineering).
- Comparisons of types of ploughs (Mechanical Engineering).
- Flexure of beams (Civil Engineering).
- Infiltration studies (Civil Engineering).
- Differential equations (Mathematics).

(vii) Investigation of the properties of certain integral transforms.

(viii) Mathematical investigation of combined diffusion and reaction in polarographic analysis.

(ix) Investigation of the relation between the addition theorems satisfied by certain periodic functions and the coefficients in their power series.

(x) Mathematical investigation of the elastic properties of shafts and hubs of various shapes.

(xi) Wedge indentation of an elastic half-plane.

(xii) An axiomatic theory of sets.

(e) Publications:


(viii) Articles in "Australian Mathematics Teacher" by S. J. Prokhovnik. ("Evaluation of Trigonometrical Functions without Formulae", and "Yet another Proof of Pythagoras!").


**SCHOOL OF ARCHITECTURE AND BUILDING**

(a) As a requirement for the degree of Master of Architecture:

(i) Economy of materials in multi-storey structures—F. Woolard.

(ii) Design of auditoria with particular reference to acoustics—Miss A. Greenslade.

(iii) A critical analysis of aesthetic principles underlying contemporary architectural design—P. Spooner.

(iv) Walter Burley Griffin, landscape architect—P. F. Harrison.

(v) Problems of dead load reduction in architecture and building—I. K. Lodens.

(vi) Design and planning of university residential colleges—N. J. Anderson.

(b) Other projects:


(iii) Four lectures delivered at University of Sydney on "Architecture in Relation to Planning", March, 1958—Professor F. E. A. Towndrow.
(iv) A brief investigation has been made into the problem of sound transmission from room to room through acoustic ceilings, and a method of overcoming this common difficulty has been found—R. O. Phillips and R. S. Caddy.

(v) The interreflection of light in rooms is being investigated by the methods of matrix algebra, and a programme has been developed for the University’s digital computer, UTECOM. A number of rooms have been studied, and good agreement found between calculated and observed values—R. O. Phillips and S. J. Prokhovnik.


(viii) In the teaching of structural theory it has been found that the making and testing of structural models gives students an increased knowledge and awareness of the problems to be met. For this purpose materials of comparatively low strength are useful, as ultimate loads may be more readily reached. Investigations have been made into the strengths of materials such as balsa, gypsum plaster, foamed plastic and nylon thread, in order to provide design data. A number of model structures have been constructed and tested, with satisfactory agreement between designed and actual behaviour—R. O. Phillips and L. P. Kollar.

(ix) Work with the N.S.W. Committee of the Standards Association of Australia for formulation of a S.A.A. code for “Brickworks Construction”. Committee has now completed drafts for an Interim Code which will be issued shortly—F. Woolard.

(c) Publications:


**SCHOOL OF APPLIED PSYCHOLOGY**

(a) As a requirement for the degree of Doctor of Philosophy:—

Research into the personality and intellectual qualities of executives—E. Davies.

(b) Other projects:—

(i) An investigation of the effects of television on the habits and attitudes of families in the Sydney metropolitan area.

(ii) A research study of the morale of railway workers.

(iii) A survey of executives in the advertising industry.

(iv) Blood donor research study.

(v) An investigation into the work of air control officers.

(vi) The validation of the use of motivation research techniques in marketing.

**SCHOOL OF TEXTILE TECHNOLOGY**

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) The interaction of ionizing radiation with textile materials—P. Kenny.

(b) As a requirement for the degree of Master of Science:—

(i) The ageing of fibre assemblies—A. D. Dircks.

(ii) The electrical properties of wool—J. E. Algie.

(c) Other projects:—

(i) The significance of single fibre properties in processing and end use.

(ii) Quality control in textile manufacture.

(iii) The yellowing of wool.

(iv) The relationship between fine structure and the physical and chemical properties of high molecular weight synthetic poly-peptides.

(v) The influence of surface active agents in wet processing.

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(d) Publications:


---

**School of Accountancy**


(ii) Australian Finance Companies—Sources and Uses of Funds—W. L. Burke and N. Runcie.

(iii) Marginal Costs by Regression Analysis—W. L. Burke.


**Publications:**


---

**School of Economics**

(i) Cost inflation and demand inflation—J. D. Pitchford.

(ii) Study of economics of transport—H. M. Kolsen.
(iii) The effectiveness of imperial preference tariffs in Australia—Z. M. Kubinski.

(iv) The possibilities of an “Expenditure Tax” in the Sudan—Z. M. Kubinski.

(v) Research into industrial relations in industry in New South Wales—J. Child.

(vi) A social economic history of the Bay of Plenty, New Zealand—J. Child.

(vii) Study of the lognormal distribution—Sheila Rowley.

(viii) Central banking problems of dependent economies with particular reference to those of Australia, New Zealand and Ceylon—D. C. Rowan.

Publications :


School of Biological Sciences

(a) As a requirement for the degree of Doctor of Philosophy :

(i) Aromatic biosynthesis in the higher fungi—R. K. Crowden.

(ii) The fine structure of the cell wall in higher fungi—A. E. Wood.

(b) As a requirement for the degree of Master of Science :

(i) The relationship between chemical structure and antimicrobial activity—R. G. H. Barbour.

(ii) A study of the iron-containing pigments of higher fungi with special reference to those concerned in respiration—Pamela A. Connford.

(iv) The variation of cell-wall composition in the polyporaceae—R. O'Brien.

(v) Porphyrin synthesis by a glycine-chicken red cell system as a function of oxygen tension—J. Bostrom.

(vi) Studies in the surface spoilage of some meat products—W. R. Sadler.


(ix) Studies on the relationship between auxin action and the state of pectin methyl esterase in the plant cell—M. Macey.

(c) Other Projects:

(i) The adaption of β-galactosidase in yeast when grown at limiting lactose concentrations.

(ii) The influence of a concentration gradient on the growth of chicken kidney in continuous culture.

(iii) The formation of cytochrome in yeast when grown at a series of oxygen tensions.

(iv) The microbial degradation of aromatic compounds by the higher fungi.

(v) Studies on collagenous materials.

(vi) Preservative and anti-fouling treatments for rope shark nets.

(vii) The skeletal anatomy of Leiopelma hamiltoni and the effect of neotony on the genus.

(viii) Studies on the emergence rhythm of Drosophila melanogaster.

(ix) Nitrogen balance in natural plant communities.

(x) Fractionation of the cell-wall of Polyporus tumulosus.

(xi) Studies on the endocrine organs of elasmobranch fishes.

(d) Publications:

SCHOOL OF TRAFFIC ENGINEERING

(a) As a requirement for the degree of Master of Engineering:


(ii) The effect on aircraft traffic control of bearing measuring equipment—G. A. Chandler.

(b) Other Projects:

(i) Traffic studies in Pitt Street, Sydney.

(ii) Travel patterns and traffic survey of the Manly-Warringah area.

(iii) The effect of buses on the traffic capacity of the Sydney Harbour Bridge.

(iv) Preliminary investigation of parking requirements for the University of Technology at Kensington.


(c) Publications:


SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

English


(iv) Modern political novelists—R. G. Geering.

(v) Research into the literature of the 18th century with special reference to the work of Swift, and comparative studies of 18th and 20th century prose satire—R. G. Geering.


(viii) Henry James' "Author of Beltraggio": An Inquiry—S. Tick.


(x) 20th century verse satire—Mrs. J. A. Smith.

Publications:


History

(i) A comparative study of the development of the Australian and British Labour Movements in the 19th century (part of work done in England as Rockefeller Research Fellow attached to University of Oxford)—N. B. Nairn.


(iii) The Development of the White Australia Policy—N. B. Nairn.

(iv) Political, social and economic history of New South Wales, 1850–75—S. M. Ingham.

(v) Conservatism in Australia, 1890–1910 (paper read at Australian National University, 26 June, 1958)—S. M. Ingham.

(vi) Research into the life and work of Sir Henry Parkes with a view to publication of a biography (English background examined in 1957, as Nuffield Research Scholar attached to London University).—A. W. Martin.

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(vii) Pastoralist influence in the New South Wales Legislative Assembly, 1870-90 (paper read at Australian National University, 16 July, 1958)—A. W. Martin.

(viii) The foundation of the Universities of the British Empire in the 19th century—K. J. Cable.

(ix) Church, state and education in New South Wales, 1788-1914—K. J. Cable.

(x) The history of Sydney Boys' High School—K. J. Cable.

(xi) The population of Victoria, 1851-1901: an appraisal of the statistical source material, together with an analysis of the growth and structure of the population of the colony—D. R. G. Packer.

(xii) The background and administration of the Immigration Restriction Act, 1901, and Amendments, 1901-25—A. T. Yarwood.

Publications:—


(iii) History has Justified the White Australia Policy. A. T. Yarwood, Daily Telegraph, 5th June, 1958.

Philosophy

(i) The philosophy of Sir T. Percy Nunn—J. B. Thornton.

(ii) Use of logical languages in automatic computation. This work consisted primarily of the development of a special "instruction language" for use in electronic computation, based on notations used in formal logic; and the writing of a number of general and special programs for UTECOM—C. L. Hamblin.

(iii) The theory of information. Descriptive paper read to the N.S.W. University of Technology Philosophical Society, November, 1957—C. L. Hamblin.


(vi) Class-membership and class-inclusion. Paper read to the N.S.W. University of Technology Philosophical Society, October, 1957—R. S. Walters.

Publication :


Government

(i) Research into local government extended from Sydney area to survey whole of New South Wales system. Paper read on this topic to open discussion at a meeting of Conference of University Teachers of Political Science held in Canberra, August, 1957—R. E. Atkins.

(ii) Determinist theories in international relations, the example of social Darwinism—P. D. Marchant.

Publication :


Sociology

(i) Critical survey of training for social work in Australia—M. S. Brown.

(ii) Social functioning of educable subnormals—M. S. Brown.

Publications :


Newcastle University College

DEPARTMENT OF ARTS

Classics

(i) "Latinitas" as an element of style in latin prose—J. Duhigg.

Publication :

Economics
(i) Survey of flood losses in the Hunter Valley—C. C. Renwick.
(ii) Economic history of Newcastle—a study undertaken with honours students of the Department—C. C. Renwick.
(iii) Survey of Maitland floods, Part II—C. C. Renwick.
(iv) Method of calculating a flood-cost index—C. C. Renwick.
(vi) Liquidity, the money supply and investment in Australian economy, 1929–1955—R. W. Peters.
(vii) The Australian tariffs in the post-war period—M. Bernasek.
(viii) Survey of hire purchase in Australia since 1930 (with special reference to the Newcastle and Hunter region)—B. J. Gordon.
(ix) The present state of national accounting—B. L. Johns.
(x) Problems in the theory of growth with special reference to analysis and measurement of the capital stock—W. P. Hogan.
(xi) Analysis of financial and monetary systems—W. P. Hogan.

Publication:—

English
(i) A study of the prose writings of Dylan Thomas—D. C. Muecke.
(v) Christ-consciousness in the Middle Ages—J. P. Beston.

Publication:—
French

(i) Comparatisme—an article on "Rabelais and Pulci" is being prepared—K. H. Hartley.

(ii) Linguistics—An article entitled "La notion de 'raison' chez Vaugelas", is now in process of completion—I. P. Barko.

(iii) Linguistics—The ideal of the "prud'homme" in the middle ages and the "honnete homme" in the classical period—I. P. Barko.

(iv) Literary criticism into the work of Loys Masson—M. Caillot.

Publications:—

(i) Some Italian Sources for La Pucelle d'Orleans—K. H. Hartley, Modern Language Notes, Nov., 1957, LXXII.


Geography

(i) An investigation of the weather sequences and air mass conditions underlying the climatic variety of eastern Australia—A. D. Tweedie.

(ii) An investigation into the climatic variety of the Hunter Valley—A. D. Tweedie.

(iii) A study of the geographical character of Queensland and Northern Australia—A. D. Tweedie.


(v) A study of the essentials of the geography of metropolitan Sydney—K. W. Robinson.


German

(i) A modern English-German word and phrase book—G. K. Connolly.

(ii) A study of German polemical literature of the 16th century—G. K. Connolly.

(iv) A study of German classical literature of the 18th and 19th Century—L. Bodi.

(v) Research work on early German literature on Australia and the South Pacific (chiefly concerned with the works of the German Essayist, George Forster)—L. Bodi.

(vi) The prognosis of aptitude for modern languages with particular reference to German and the primary school child—M. Norst.

(vii) Realism and symbolism in the work of Adalbert Stifter—M. Norst.

History

(i) Australian History—historical background of the Australian Universities. (A chapter has been prepared for the forthcoming "Australian Humanities Survey" in collaboration with Professor A. N. Jeffares of the University of Leeds)—J. J. Auchmuty.


(iii) The history of international law and organisation (with particular reference to the part played by Australia in the League of Nations and the United Nations)—G. A. Cranfield.

(iv) The Australian pearling industry—J. P. S. Bach.

(v) British settlement in North Australia—J. P. S. Bach.


(vii) A critical survey of American foreign policy, including reference to its bearing on Australian external relations—T. R Reese.


Publications:


Philosophy

(i) Men or Minds—A. M. Ritchie. (A paper read to the 1957 Annual Congress of the Australian Association of Philosophy).

(ii) The relation between logical systems and language in use—A. M. Ritchie.

(iii) Research into the actual structure of the sentential calculus as an uninterpreted and interpreted calculus—A. M. Ritchie.

(iv) Research into the relation between psycho-analytic theory and both conventional theories of morality and theories of mind—A. J. Anderson.

Psychology

(i) Opinions and attitudes in relation to personality; a theoretical and methodological study—D. R. Martin.

(ii) The hyperbola as the theoretical model of problem-solving, with particular reference to relatively unstructured situations—A. C. Hall.

(iii) Some aspects of aesthetic appreciation in pictorial art—A. C. Hall.

(iv) Study of reading efficiency at the tertiary level—I. Edmonds.

(v) The perception of slant—I. Edmonds.

(vi) Experimental studies of habituation—K. H. Star.

(vii) Experimental study of re-active inhibition and its relationship to certain personality traits—K. H. Star.
THE NEW SOUTH WALES
GENERAL
STATEMENT OF INCOME
1st JULY, 1957.

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries and Staff Charges</td>
<td>1,351.462</td>
<td>18</td>
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<tr>
<td>Payroll Tax</td>
<td>22,110</td>
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<tr>
<td>Employers' Superannuation Contribution</td>
<td>59,185</td>
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<td>4</td>
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<tr>
<td>Total</td>
<td>1,442,738</td>
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<td>Teaching Departments—General Maintenance and Purchase of Apparatus</td>
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<tr>
<td>Books, Periodicals and Pamphlets</td>
<td>49,558</td>
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<td>Power, Lighting and Heating</td>
<td>32,590</td>
<td>4</td>
<td>3</td>
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<tr>
<td>Printing and Posting</td>
<td>13,378</td>
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<tr>
<td>Administrative Supplies, Travelling and Other Expenses</td>
<td>13,081</td>
<td>11</td>
<td>1</td>
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<tr>
<td>Telephones and Advertising</td>
<td>10,258</td>
<td>17</td>
<td>9</td>
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<tr>
<td>Expenses of New Appointments</td>
<td>8,664</td>
<td>13</td>
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<tr>
<td>Plant</td>
<td>6,700</td>
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<tr>
<td>Rates and Insurances</td>
<td>6,272</td>
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<td>4</td>
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<tr>
<td>Examination Expenses</td>
<td>5,180</td>
<td>0</td>
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<tr>
<td>Expenses of Motor Vehicles</td>
<td>2,839</td>
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<td>4</td>
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<tr>
<td>Grant to Caterers</td>
<td>1,315</td>
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<tr>
<td>Contribution to Water Research Foundation</td>
<td>1,000</td>
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<td>0</td>
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<tr>
<td>Contribution to Vice-Chancellor's Secretariat</td>
<td>800</td>
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<td>0</td>
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<tr>
<td>Contribution to Applied Arts Fund</td>
<td>500</td>
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<tr>
<td>Rent of Premises</td>
<td>465</td>
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<td>Legal Fees</td>
<td>453</td>
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<td>Contribution to the Chair of Town and Country Planning—Sydney University</td>
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<td>Bursaries</td>
<td>215</td>
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<tr>
<td>Furniture Repairs</td>
<td>18</td>
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<tr>
<td>Miscellaneous Expenses</td>
<td>3,385</td>
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</tr>
<tr>
<td>Total</td>
<td>£1,744,984</td>
<td>3</td>
<td>5</td>
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</tbody>
</table>
# UNIVERSITY OF TECHNOLOGY

## FUNDS AND EXPENDITURE

TO 30th JUNE, 1958

<table>
<thead>
<tr>
<th>Income</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
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<tbody>
<tr>
<td>Fees</td>
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<td></td>
<td></td>
<td>214,278</td>
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<td>Other Income</td>
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<td></td>
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<td>30,640</td>
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<tr>
<td>Commonwealth Assistance Grants—</td>
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<td></td>
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<tr>
<td>Basic Grant</td>
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<td>83,729</td>
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<td>Second Level Grant</td>
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<td>224,421</td>
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<tr>
<td>Less Paid to Residential Hostel Account</td>
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<td></td>
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<td>4,200</td>
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<tr>
<td>State Grants (Consolidated Revenue)</td>
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<tr>
<td>State Grants (Consolidated Revenue)</td>
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<td></td>
<td>1,196,115</td>
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| Total Income |     |      |     | 1,744,984 | 3   | 5   |
THE NEW SOUTH WALES COMMONWEALTH
STATEMENT OF INCOME
1st JULY, 1957,

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>£</th>
<th>a.</th>
<th>d.</th>
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<tbody>
<tr>
<td>Teaching Departments—General Maintenance and Purchase of Apparatus</td>
<td>...</td>
<td>...</td>
<td>6,581 2 9</td>
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<tr>
<td>Books, Periodicals and Pamphlets</td>
<td>...</td>
<td>...</td>
<td>9,000 0 0</td>
</tr>
<tr>
<td>Balance, 30th June, 1958</td>
<td>...</td>
<td>...</td>
<td>47,908 17 3</td>
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</tbody>
</table>

£56,500 0 0
### UNIVERSITY OF TECHNOLOGY

**EMERGENCY GRANT**

AND EXPENDITURE

TO 30th JUNE, 1958

<table>
<thead>
<tr>
<th>INCOME</th>
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</thead>
<tbody>
<tr>
<td>£</td>
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<tr>
<td>Commonwealth Emergency Grant</td>
</tr>
<tr>
<td>Less Paid to Residential Hostel Account</td>
</tr>
<tr>
<td><strong>Total Income</strong></td>
</tr>
<tr>
<td><strong>£50,500</strong></td>
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### The New South Wales Statement of Balances

#### Liabilities

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<th>Description</th>
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<th>s.</th>
<th>d.</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
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<tbody>
<tr>
<td>N.S.W. State Treasury Grant for Working Capital</td>
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<td></td>
<td></td>
<td>6,500</td>
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<tr>
<td><strong>Balances</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Special Purposes Funds (Research)—(As per Statement &quot;A&quot; attached)</td>
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<tr>
<td>Special Purposes Funds (Scholarships, Bursaries and Prizes)—(As per Statement &quot;B&quot; attached)</td>
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<td>9,691</td>
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<tr>
<td>Special Purposes Funds (Other Purposes)—(As per Statement &quot;C&quot; attached)</td>
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<td></td>
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<tr>
<td>Commonwealth Emergency Grant</td>
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<td></td>
<td></td>
<td>47,968</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>General Loan Grants—(As per Statement &quot;D&quot; attached)</td>
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<td>5</td>
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<tr>
<td>Invested Funds Accounts—(As per Statement &quot;E&quot; attached)</td>
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<td>24,330</td>
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<td></td>
<td>£396,743</td>
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</table>

*£297,583 7s. 6d., invested at Short Call or for*

D. W. PHILLIPS, Pro Vice-Chancellor.

The books and accounts of the University of New South Wales have been audited in Wales University of Technology Act, 1949-1955.

In my opinion the above statement correctly sets out the financial position of the explanations given to me and as shown by such books and accounts.

Sydney, 30th December, 1958.
## UNIVERSITY OF TECHNOLOGY

### AS AT 30th JUNE, 1958

#### Assets

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BANK ACCOUNTS—WITH RURAL BANK OF NEW SOUTH WALES</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Parking House Branch—N.S.W. University of Technology Account</td>
<td>69,239</td>
<td>6</td>
<td>6</td>
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<tr>
<td>Newcastle Branch—N.S.W. University of Technology, Newcastle</td>
<td>4,000</td>
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<td>0</td>
</tr>
<tr>
<td><strong>SPECIAL DEPOSITS ACCOUNT NO. 1228—WITH N.S.W. STATE TREASURY</strong></td>
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**£396,743 17 0**

Short term. (See Statement “F” attached).

R. H. DAVIS, Accountant.

accordance with the provisions of Section 43 of the Technical Education and New South Wales University as at 30th June, 1958, according to the best of my information and the ex-

(Sgd.) W. J. CAMPBELL,

Auditor-General of New South Wales.
# THE NEW SOUTH WALES SPECIAL PUR STATEMENT

## STATEMENT OF RECEIPTS AND PAYMENTS FOR THE

<table>
<thead>
<tr>
<th>Fund</th>
<th>Balances Brought Forward 1st July, 1957</th>
<th>Receipts 1957-58</th>
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<td>Extraction of Thorium and Rare Earths</td>
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### UNIVERSITY OF TECHNOLOGY

**POSES FUNDS**

**arch)**

"A"

**FINANCIAL YEAR 1st JULY, 1957, TO 30th JUNE, 1958**

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<th>Equipment (Capital)</th>
<th>Other Expenses</th>
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<th>Balances Carried Forward 30th June, 1958</th>
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653
Statement A—continued.

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<th>Fund</th>
<th>Balances Brought Forward 1st July, 1957</th>
<th>Receipts 1957-58</th>
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£ 135,318 16 2 56,573 19 8 191,892 15 10

* £500 received from Hunter Valley Research Foundation.
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<td>H. L. Wheeler Prize Fund</td>
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£ 8,776 16 0 16,846 0 2 25,622 16 2

* Invested £1,430.
† Invested £1,000.
‡ Invested £100.


**UNIVERSITY OF TECHNOLOGY**

**POSES FUNDS**

"B"

saries, Prizes, Etc.)

THE FINANCIAL YEAR 1st JULY, 1957, TO 30th JUNE, 1958

<table>
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<th>Payments, 1957-58</th>
<th>Balance Carried Forward 30th June, 1957</th>
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<td>Other Expenses</td>
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<td>15,931 10 8</td>
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657
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<th>Fund</th>
<th>Balances Brought Forward, 1st July, 1957</th>
<th>Receipts, 1957-58</th>
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<td>£ 4,570 9 s. d.</td>
<td>£ 10,000 s. d.</td>
<td>£ 14,570 9 s. d.</td>
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<td>£ 100 0 s. d.</td>
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<td>Australian Leather Research Association Fellowship Grant</td>
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<td>Bradford Cotton Mills—Donation for Purchase of Mountain Portable P.H. Meter</td>
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<td>Careers Exhibition—School of Wool Technology</td>
<td>£ 1,160 0 s. d.</td>
<td>£ 4,724 9 s. d.</td>
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<td>£ 900 0 s. d.</td>
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<td>Donations towards equipping Paint Technology Laboratory</td>
<td>£ 3,604 14 0 s. d.</td>
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<td>Donations towards establishment of a Library Fund</td>
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<td>Donation to University Special Purposes Fund</td>
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<td>Lake Macquarie Power Station</td>
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<td>Tallawarra Power Station</td>
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<td>£ 1,100 0 0 s. d.</td>
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<td>Joint Coal Board Donation for Equipment of N.S.W. University of Technology and Various Technical Colleges</td>
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<td>Joint Coal Board Grant to Purchase Equipment for Operation of Diester Concentrating Table</td>
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<td>H. Jones And Company—Grant for Department of Food Technology</td>
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<td>£ 8,727 13 3 s. d.</td>
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<td>J. H. Liddle and Epstein Pty. Ltd.—Grant for Department of Food Technology</td>
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# UNIVERSITY OF TECHNOLOGY

POSES FUNDS

"C"

Purposes)

THE FINANCIAL YEAR 1st JULY, 1957, TO 30th JUNE, 1958

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659
Statement C—continued.

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<td>Newcastle University College Commerce Courses</td>
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<td>Sheep Breeders Grant</td>
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<td>Timbrol Ltd., Special Post Graduate Courses</td>
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THE NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY

General Loan Account Grants from N.S.W. State Treasury

STATEMENT "D"


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<th></th>
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<td>4,319,015 2 3</td>
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<td>Total Payments</td>
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<tr>
<td>Balance carried forward end of year</td>
<td>3,420 5 5</td>
</tr>
<tr>
<td>Total payments plus balance carried forward</td>
<td>670,234 9 3</td>
</tr>
<tr>
<td>Total payments plus balance carried forward</td>
<td>3,420 5 5</td>
</tr>
<tr>
<td>Aggregate Position for Period 1st July, 1949, to 30th June, 1958</td>
<td>£4,587,716 4 2</td>
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## THE NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY

### STATEMENT "E"

#### SCHEDULE OF INVESTMENTS AS AT 30th JUNE, 1958

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<th>Face Value</th>
<th>Book Value</th>
<th>Maturity Date</th>
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<td>Metropolitan Water, Sewerage and Drainage Board—</td>
<td>Per cent.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
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<td></td>
</tr>
<tr>
<td>Inscribed Stock—Loan No. 129</td>
<td>4(\frac{1}{2})</td>
<td>250 0 0</td>
<td>250 0 0</td>
<td>1-3-1965</td>
<td>Frank W. Peplow Prize Fund.</td>
</tr>
<tr>
<td>Inscribed Stock—Loan No. 134</td>
<td>4(\frac{1}{2})</td>
<td>600 0 0</td>
<td>600 0 0</td>
<td>1-6-1965</td>
<td>Sydney Technical College Union Prize Fund.</td>
</tr>
<tr>
<td>Inscribed Stock—Loan No. 136</td>
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<td>250 0 0</td>
<td>250 0 0</td>
<td>1-9-1965</td>
<td>Hostel Funds.</td>
</tr>
<tr>
<td>Inscribed Stock—Loan No. 138</td>
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<td>10,000 0 0</td>
<td>10,000 0 0</td>
<td>1-9-1965</td>
<td>Simon-Carves (Aust.) Pty. Ltd., Prize Fund.</td>
</tr>
<tr>
<td>Inscribed Stock—Loan No. 136</td>
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<td>100 0 0</td>
<td>100 0 0</td>
<td>1-9-1965</td>
<td>B. A. Helmore Prize Fund.</td>
</tr>
<tr>
<td>Inscribed Stock—Loan No. 145</td>
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<td>500 0 0</td>
<td>1-4-1976</td>
<td>H. L. Wheeler Prize Fund.</td>
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<tr>
<td>Inscribed Stock—Loan No. 145</td>
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<td>10,000 0 0</td>
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<td>Hostel Funds.</td>
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<td>Inscribed Stock—Loan No. 178</td>
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<td>1,000 0 0</td>
<td>1-4-1976</td>
<td>Morison Special Economics Prize Fund.</td>
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<td>Inscribed Stock—Loan No. 199</td>
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<td>100 0 0</td>
<td>1-7-1977</td>
<td>W. E. Clegg Memorial Prize Fund.</td>
</tr>
<tr>
<td>Commonwealth Loan—</td>
<td>5</td>
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<td>100 0 0</td>
<td>15-4-1978</td>
<td>Gertrude Helmore Memorial Prize Fund.</td>
</tr>
<tr>
<td>Inscribed Stock—Loan No. 102</td>
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<td>100 0 0</td>
<td>15-4-1978</td>
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<tr>
<td>Rural Bank of New South Wales—</td>
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<td>490 0 0</td>
<td>490 0 0</td>
<td>10-12-1958</td>
<td>Elliotts Rural Laboratorios Scholarship Fund.</td>
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<td>Fixed Deposit</td>
<td>2</td>
<td>480 0 0</td>
<td>480 0 0</td>
<td>10-6-1959</td>
<td>Shown in Statement of Balances.</td>
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<td>Fixed Deposit</td>
<td>2</td>
<td>480 0 0</td>
<td>480 0 0</td>
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<td>General Investment of Funds held (Commonwealth Bonds 3(\frac{1}{2}) per cent., 1955-58, held as Security).</td>
</tr>
<tr>
<td>Fixed Deposit</td>
<td>3</td>
<td>490 0 0</td>
<td>490 0 0</td>
<td>10-6-1960</td>
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<td>Ian Potter &amp; Co.—Buy Back Holding Contract...</td>
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<td>99,958 7 6</td>
<td>99,958 7 6</td>
<td>6-7-1957</td>
<td>General Investment of Funds held.</td>
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<tr>
<td>Commonwealth Loan—</td>
<td>4</td>
<td>50,000 0 0</td>
<td>49,625 0 0</td>
<td>15-5-1959</td>
<td>General Investment of Funds held.</td>
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<td>Loan No. 106</td>
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<td>50,000 0 0</td>
<td>49,437 10 0</td>
<td>15-5-1961</td>
<td>General Investment of Funds held.</td>
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<tr>
<td>Commonwealth Loan—</td>
<td>3(\frac{1}{2})</td>
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<td>48,562 10 0</td>
<td>15-10-1968</td>
<td>General Investment of Funds held.</td>
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<td>Inscribed Stock—Loan No. 110</td>
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<td>26-9-1961</td>
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<td>Commonwealth Treasury Bonds</td>
<td>3(\frac{1}{2})</td>
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<td>50,000 0 0</td>
<td>15-10-1968</td>
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<td>Metropolitan Water, Sewerage &amp; Drainage Board Private Loan—No. 135</td>
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<td>50,000 0 0</td>
<td>50,000 0 0</td>
<td>26-9-1961</td>
<td>General Investment of Funds held.</td>
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<td>£324,280 7 6</td>
<td>£321,913 7 6</td>
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