The New South Wales UNIVERSITY of TECHNOLOGY

CALENDAR, 1957
CALENDAR

OF

THE NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY

1957
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(Information in this Calendar has been brought up to date as at 31st December, 1956)

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THE NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY.

Calendar—1957

January—
Monday 28........  Australia Day—Public Holiday.

February—
Monday 11........  Enrolments begin all courses except 2nd year of courses I, V, VI, VII, VIII and IX.
Tuesday 12........  Professorial Board meets.
Monday 18........  First term begins.

March—
Monday 11........  Council meets.
Tuesday 12........  Professorial Board meets.
Wednesday 20.....  Faculty of Architecture meets.
Friday 22.........  Conferring of Degrees—Newcastle University College.
Monday 25.........  Enrolments and lectures commence—2nd year courses I, V, VI, VII, VIII and IX.
Wednesday 27.....  Faculty of Engineering meets.

April—
Wednesday 3.......  Faculty of Science meets.
Tuesday 9.........  Professorial Board meets.
Saturday 13.......  Conferring of Degrees.
Wednesday 17.....  Faculty of Technology meets.
Friday 19 to Mon-
day 22.
Thursday 25.......  Anzac Day—Public Holiday.

May—
Wednesday 1.......  Faculty of Humanities and Social Sciences meets.
Council Election—undergraduate representative.
Saturday 11.......  First term ends.
Monday 13........  Council meets.
Monday 13 to     Vacation (2 weeks).
Saturday 25.
Tuesday 14........  Professorial Board meets.
Monday 27.........  Second term begins.
Thursday 30.......  Council Election—graduate representatives.
CALENDAR—1957—continued.

June—
Wednesday 5...... Faculty of Commerce meets.
                  Council Election—faculty representatives.
Tuesday 11 ...... Professorial Board meets.
Thursday 13 ...... Council Election—teaching staff representative.
Monday 17........ Queen's Birthday—Public Holiday.
Wednesday 19 ... Faculty of Architecture meets.
Wednesday 26 ... Faculty of Engineering meets.

July—
Wednesday 3...... Faculty of Science meets.
Monday 8 ........ Council meets.
Tuesday 9 ....... Professorial Board meets.
Wednesday 17 ... Faculty of Technology meets.
Wednesday 24 ... Faculty of Humanities and Social Sciences meets.

August—
Monday 5 ......... Bank Holiday—Classes meet as usual.
Wednesday 7...... Faculty of Commerce meets.
Tuesday 13 ...... Professorial Board meets.
Saturday 17..... Second term ends.
Monday 19 to Vacation (2 weeks).
Saturday 31.

September—
Monday 2 .......... Third term begins.
                  Examinations commence—two-term courses, except
                  2nd year of courses I, V, VI, VII, VIII, IX.
Wednesday 4...... Faculty of Architecture meets.
Monday 9 .......... Council meets.
Tuesday 10 ...... Professorial Board meets.
Saturday 14 ..... Examinations cease—two-term courses.
Monday 16........ Industrial training begins—two-term courses not engaged
                  in Survey Camp.
Monday 16 to
                  Friday 20
                  Survey Camp—1st year courses VII and VIII, 3rd year
                  courses V, VI, VII, VIIA, VIIB and VIII, 4th year
                  courses VII and VIII, 7th year course VIIIB.
Wednesday 18 ...
                  Faculty of Engineering meets.
Monday 23......... Industrial training begins—two-term courses attending
                  Survey Camp, except 3rd year of courses VII, VIIA
                  and VIII.
Monday 23 to
                  Friday 27.
                  Geology excursion—3rd year of courses VII, VIIA
                  VIIB and VIII, 4th year of courses VII, VIIB.
Wednesday 25 ...
                  Faculty of Science meets.
Monday 30......... Industrial training begins—3rd year of courses VII,
                  VIIA and VIII.
CALENDAR—1957—continued.

October—

Wednesday 2...... Faculty of Technology meets.
Saturday 5 ...... Lectures cease—2nd year courses I, V, VI, VII, VIII and IX.
Monday 7 ....... Six Hour Day—Public Holiday.
Tuesday 8 ....... Professorial Board meets.
Monday 14....... Examinations commence—2nd year courses I, V, VI, VII, VIII and IX.
Wednesday 16 ... Faculty of Humanities and Social Sciences meets.
Saturday 26 ..... Examinations cease—2nd year courses I, V, VI, VII, VIII and IX.
Monday 28....... Industrial training commences—2nd year courses I, V, VI, VII, VIII and IX.

November—

Saturday 9........ Lectures cease—diploma and three-term degree courses
Monday 11........ Council meets.
Tuesday 12 ...... Professorial Board meets.
Monday 18....... Examinations begin—diploma and three-term degree courses.
Saturday 23 ...... Third term ends.

December—

Saturday 7........ Examinations end—diploma and three term degree courses.
Tuesday 10 ...... Professorial Board meets.

1958.

February—

Monday 10....... Enrolments begin.
Tuesday 11 ..... Professorial Board meets.
Monday 17........ First term begins.
LOCATION OF SCHOOLS AND STAFF.

The location of the various Schools of the University and their staff is as follows:

The Schools of Architecture and Building, Humanities and Social Sciences, Physics, Mining Engineering and Applied Geology, and Textile Technology and the Department of Production Engineering are in the main building at Barker Street, Kensington.

The Schools of Accountancy, Economics, Hospital Administration, Applied Psychology, Mathematics and Traffic Engineering are located on the western side of Anzac Parade, near Day Avenue, Kensington, and the Schools of Chemical Engineering and Metallurgy are situated at the northern end of the Kensington site, at High Street.

The Schools of Chemistry, Biological Sciences, Civil Engineering, Electrical Engineering, and Mechanical Engineering are in the grounds of Sydney Technical College, Broadway.

The School of Wool Technology is at East Sydney Technical College, Forbes Street, Darlinghurst.

The Vice-Chancellor and the Divisions of the Registrar and the Bursar are in the main building at Barker Street, Kensington; the remainder of the University's administrative staff, including the Accounts Branch, is at the Sydney Technical College, Broadway.

The postal address at Kensington is Box 1, P.O., Kensington.
PREFACE.

Incorporated by Act of the New South Wales Parliament on 1st July, 1949, the N.S.W. University of Technology was established to assist in meeting the urgent demand in Australia for increasing numbers of technologists and applied scientists, and to provide them with the means of advanced training and research.

In the words of the Act, the objects of the University 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.

The Incorporating Act was amended in 1955, and by the Act, as amended, provision is made for the government of the University by a Council 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 present membership of the Council is listed on pages 47 and 48 of the Calendar.

The Council under the authority given to it by the Act—

(a) may provide courses in applied science, engineering, technology, commerce, industrial organisation and such other related 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.

The first courses, leading to the degree of Bachelor of Engineering, were instituted in 1948 in Civil, Electrical, Mechanical, and Mining Engineering. These courses were planned to give students full-time lecture and laboratory instruction at the University for approximately half the year, with planned industrial experience for the remainder of the year. This initial step was made possible by the work of the Developmental Council appointed in August, 1947, by the Minister for Education, the Hon. R. J. Heffron, M.L.A. Courses leading to
the degree of Bachelor of Science were introduced in Applied Chemistry and Chemical Engineering for the 1949 academic year, and in Applied Physics and Wool Technology for the 1951 academic year. A first degree course in Architecture (B.Arch.) was established in 1950, and in 1954 a further full-time Bachelor of Science course, in Metallurgy, and a four-year degree course in Applied Geology leading to the degree of Bachelor of Engineering (Geology), were offered. A four-year full-time course in Food Technology (B.Sc.) was also instituted in 1954.

Part-time degree courses were introduced in 1954 in Applied Biology, Applied Chemistry, Applied Geology, Chemical Engineering, Civil Engineering, Electrical Engineering, Food Technology, General Science, Industrial Chemistry, Leather Chemistry, Mechanical Engineering and Metallurgy. These courses are of the same standard as the full-time degree courses, and are arranged to enable the student to remain continuously in employment related to his studies throughout the whole course. A part-time course was instituted in Applied Psychology in 1955, leading to the degree of Bachelor of Science in Psychology.

Following the Council's decision in 1955 to establish a Faculty of Commerce, appointments were made to foundation Chairs in Accountancy, Economics and Hospital Administration. In 1957 full-time and part-time undergraduate courses, specialising in Accountancy, Economics, Statistics or Applied Psychology, and leading to the degree of Bachelor of Commerce, will be offered and a postgraduate course in Hospital Administration, leading to the degree of Master of Hospital Administration will also be conducted.

The newly-established School of Textile Technology will offer in 1957 full-time courses, leading to the degree of Bachelor of Science, in Textile Chemistry, Textile Physics, Textile Engineering and Textile Manufacture.

Appointments were made in 1956 to foundation Chairs in Highway Engineering and Traffic Engineering and courses in these fields are now being planned.

Two features are emphasised in the planning of first degree courses of the University of Technology. 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 a year, 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 (Course II—Pass) 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, 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. In view of the development which the Humanities subjects have undergone, the Council approved the establishment of a Faculty of Humanities and Social Sciences in 1954.

The University offers the customary club and social features of university life—sport and societies dealing with literature, religion, art, music and public questions. During 1952 the constitution of the University of Technology Students' Union was approved by Council. Membership of the Union is compulsory for all registered students. Membership of the N.S.W. University of Technology Sports Association is also compulsory for all registered students.

In order to secure a closer integration between the relevant activities of the Department of Technical Education and the University, arrangements were completed during 1951 for the University to administer twenty of the Department's professional diploma courses and to further this integration in 1954 the syllabuses of the diploma courses were revised in the Faculties of Science and Engineering to align them as closely as possible with the part-time degree courses. Where a part-time degree course is conducted in the particular field of study, a student may generally qualify for the diploma of Associateship of Sydney Technical College by completing the first five years (in the case of Chemical Engineering, Food Technology and Metallurgy, six years) of the part-time degree course. Should the student then desire to take out a degree, he can do so by completing the remainder of the part-time degree course. The diploma courses now administered by the University of Technology are—


Faculty of Architecture: *Architecture, Building, Quantity Surveying.


Faculty of Commerce: *Accountancy.

Faculty of Humanities and Social Sciences: Manual Arts.

*Students completing these courses may proceed to the appropriate degree with full credit for their diploma studies.
Where the diploma was obtained prior to this alignment of courses, a first degree of the New South Wales University of Technology may be gained by further study in a conversion course conducted by the University.

Special investigations may be carried out on problems of technology or applied science on request, and in respect of any such investigation the Council of the University may charge such fees therefor and agree to such conditions in relation thereto as it thinks fit.

A number of industrial undertakings and Government departments are co-operating with the University by their recognition of its courses as a means of training their industrial cadets in the theory and practice of their profession. To this end, they have selected employees as students to attend degree courses, paying their fees and the ordinary cadet rates payable during their periods in industry. In many cases the attendance of such students is also counted as part of their service for seniority grading and salary purposes.

A number of scholarships with liberal living allowances have been granted, particularly from the coal-mining and metal industries.

Students may also prepare for the degrees of Master of Science, Master of Science in Psychology, Master of Architecture, Master of Engineering, Master of Hospital Administration, or Doctor of Philosophy in Science, Engineering or Architecture.

The first main building on the University site at Kensington was opened on 16th April, 1955, by the Governor of New South Wales, His Excellency Lieutenant-General Sir John Northcott, K.C.M.G., K.C.V.O., C.B., and the Schools of Physics, Architecture and Building, Humanities and Social Sciences, Mining Engineering and Applied Geology, the Department of Production Engineering, and the Registrar's and Bursar's Divisions of the University Administration are now located in this building. The Faculty of Commerce and the Schools of Applied Psychology, Mathematics, and Traffic Engineering are located on the western side of the University site at Kensington.

The School of Chemical Engineering, including the Department of Food Technology, is housed in seven light-framed permanent buildings at the northern end of the University site, and the School of Metallurgy occupies four similar buildings in the same area.

The remaining Schools of the University are operating in the Sydney Technical College grounds at Ultimo, with the exception of the School of Wool Technology, which is at East Sydney Technical College.
Power to decentralise the University's activities, both in its co-operation with industry and in its teaching services, is given to the Council, which is authorised to establish and maintain branches, departments or colleges at Newcastle, Wollongong, Broken Hill, or such other places in the State of New South Wales as it may approve. Action has been taken under this authority to establish the Newcastle University College of the University within the Newcastle Technical College and this College was opened on 3rd December, 1951.

Instruction in certain courses is also provided at Wollongong and Broken Hill, and from 1956 the first and second years of the Mechanical Engineering diploma and part-time degree courses have been offered at Orange.

In 1953 the Minister for Education announced that the New England University College would become the University of New England in 1954 with authority to confer degrees. In conjunction with this development arrangements were made for students to enrol in classes at the Newcastle College of the New South Wales University of Technology with a view to meeting the requirements for the degree of Bachelor of Arts of the University of New England, and in accordance with this arrangement Arts courses were commenced at Newcastle in 1954.

Details of the courses at Newcastle may be found in the Handbook of Newcastle University College.
TECHNICAL EDUCATION AND NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY ACT, 1949-1955.

PART III.

THE NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY.

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 New South Wales University of Technology.

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

New South Wales University of Technology.

16. (1) There shall be a New South Wales University of Technology 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 under-graduate members thereof.

(2) The University shall be a body corporate under the name of "The New South Wales University of Technology" 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.

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 related 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.

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.

New South Wales University of Technology Account.

38. (1) The University shall have an account which shall be called the “New South Wales University of Technology 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 thirtieth day of June 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 thirtieth day of June 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.

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 New South Wales University of Technology.

(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 New South Wales University of Technology Act, 1949-1955.

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 four 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.**

<table>
<thead>
<tr>
<th>Organisation</th>
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<tbody>
<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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</tr>
<tr>
<td>The Royal Australian Chemical Institute (N.S.W. Branch)</td>
<td>3</td>
</tr>
<tr>
<td>The Institute of Optometrists of New South Wales</td>
<td>3</td>
</tr>
<tr>
<td>The Royal Australian Institute of Architects, New South Wales Chapter</td>
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<tr>
<td>The Institution of Production Engineers (Sydney Section)</td>
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<tr>
<td>The Institute of Physics (Australian Branch, N.S.W. Division)</td>
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</tr>
<tr>
<td>The Australasian Institute of Mining and Metallurgy Incorporated</td>
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**Part B.**

**Representation of Industrial and Commercial Interests.**

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<th>Organisation</th>
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<td>Chamber of Manufactures of New South Wales</td>
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<tr>
<td>Sydney Chamber of Commerce</td>
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<tr>
<td>Metal Trades Employers' Association</td>
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<tr>
<td>The Employers' Federation of New South Wales</td>
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<tr>
<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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<th>Organisation</th>
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<td>Primary Producers' Union</td>
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<tr>
<td>The Graziers' Association of New South Wales</td>
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<tr>
<td>Farmers and Settlers' Association of New South Wales</td>
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</tr>
<tr>
<td>Wheat Growers' Union of New South Wales</td>
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</tbody>
</table>
Part C.

Representation of Trade Unions and Employee Organisations.

Organisation. Number of Names.

Labor Council of New South Wales .................... 1
New South Wales University of Technology Staff Association 3
New South Wales Public Service Association ............... 1

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 as 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.

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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 New South Wales University of Technology Act, 1949-1955, 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 New South Wales University of Technology Act, 1949-1955, 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 New South Wales University of Technology Act, 1949-1955, 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 New South Wales University of Technology Act, 1949-1955, 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 and Associate 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;
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;

may determine the conditions of competition for any postgraduate fellowship, scholarship or prize and make the awards: Provided that any conditions of competition approved by the Board for any postgraduate fellowship, scholarship or prize shall be subject to conditions, if any, with respect thereto made by the founder or donor;

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 New South Wales University of Technology without any examination;

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;

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 New South Wales University of Technology;

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;

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 New South Wales University of Technology Act, 1949-1955, 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 New South Wales University of Technology 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 New South Wales University of Technology any person considered by the Council to be distinguished by eminent public service in a particular technical field.
THE NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY.

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.
FREDERICK WILLIAM AYSCOUGH, B.Sc., A.R.I.C., A.R.A.C.I., Senior Lecturer in Chemical Engineering, N.S.W. University of Technology.

LLOYD SYDNEY BAKER, B.E., A.S.T.C., Assistant Contract Engineer, Westinghouse (Rosebery) Pty. Ltd.

JAMES NOEL BARRETT, Grazer; Secretary, Northern Division, Wheatgrowers' Union of New South Wales.


FRANK SYMONDS BRADHURST, Hon.D.Sc., A.S.T.C., Managing Director, Holbrooks (Asia) Pty. Ltd.

The Hon. JOHN SYDNEY JAMES CLANCY, LL.B., Justice of the Supreme Court.

WILLIAM EDWARD CLEGG, Hon.D.Sc., M.I.E.Aust., F.C.A.A., Chairman, Newcastle Technical Education District Council; Director-Consultant, Commonwealth Steel Co. Ltd.


ROBERT CLARENCE GIBSON, C.M.G., General President, Primary Producers' Union.

The Hon. WILLIAM MCCULLOCH GOLLAN, M.L.A., Minister without Portfolio.

JOHN WILLIAM GOODSELL, C.M.G., F.A.S.A., President, Metropolitan Water, Sewerage and Drainage Board.

HEINZ RICHARD HARANT, B.E., A.S.T.C., Engineer, Postmaster-General's Department.

HARRY FREDRICK HEATH, B.A., B.Ec., Member, New South Wales Public Service Board.

WILLIAM GEORGE KETT, F.S.M.C., F.I.O. (Lond.), Past President, Australian Optometrical Association; Director, Mark Foy's Ltd.

The Hon. ROBERT ARTHUR KING, M.L.C., Secretary, Labor Council of New South Wales.


The Hon. JAMES JOSEPH MALONEY, M.L.C., Minister for Labour and Industry.

FRANCIS MACKENZIE MATHEWS, B.E., M.I.E.Aust., Chairman, Wollongong Technical Education District Council; Chief Engineer, Australian Iron and Steel Limited.

CRAWFORD HUGH MUNRO, B.E., F.R.San.I., M.I.E.Aust., Professor of Civil Engineering, N.S.W. University of Technology.


RICHARD GODFREY CHRISTIAN PARRY-OKEDEN, Managing Director, Lysaghts Works Pty. Ltd.; Past President, Chamber of Manufactures of N.S.W.

DAVID WATKIN PHILLIPS, B.Sc., Ph.D., Dip.Met.Min., F.G.S., M.I.Min.E., M.Amer.I.M.E., M.Aus.I.M.M., Pro-Vice-Chancellor, Chairman of the Professorial Board, Professor of Mining Engineering and Dean of the Faculty of Technology, N.S.W. University of Technology.


ARTHUR ALFRED ROBINSON, M.B.S.I., Head of School of Footwear, New South Wales Department of Technical Education.

GREGORY BODE THOMAS, LL.B., B.Sc., B.E., Barrister.

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, Bradford Cotton Mills (Aust.) Limited; Managing Director, Bradford Cotton Mills Limited.

JOHN FELL DALRYMPLE WOOD, B.Sc., B.E., A.M.I.E. Aust., Associate Professor of Mechanical Engineering, N.S.W. University of Technology; President, N.S.W. University of Technology Staff Association.

WALLACE CHARLES WURTH, C.M.G., LL.B., Chairman of the New South Wales Public Service Board.


JOHN STEWART FRASER, Secretary to Council.
COMMITTEES OF COUNCIL.

Executive Committee.
The Chancellor (Chairman)
The Deputy Chancellor
The Vice-Chancellor
Dr. W. E. Clegg
Mr. A. Denning
Mr. J. W. Goodsell
Mr. W. G. Kett
Dr. J. K. MacDougall
Professor D. W. Phillips
Professor S. H. Roberts
Mr. R. J. Webster

Finance Sub-Committee of Executive Committee.
Mr. J. W. Goodsell (Chairman)
The Vice-Chancellor
Mr. H. F. Heath
Professor R. H. Myers
Mr. R. G. C. Parry-Okeden
Mr. R. J. Webster

Personnel Sub-Committee of Executive Committee.
The Chancellor (Chairman)
The Deputy Chancellor
The Vice-Chancellor
Mr. W. G. Kett

Academic Committee.
The Deputy Chancellor (Chairman)
The Vice-Chancellor
Dr. F. S. Bradhurst
Mr. A. Denning
Mr. H. R. Harant
Mr. H. F. Heath
Mr. W. G. Kett
Mr. F. M. Mathews
Professor R. H. Myers
Professor D. W. Phillips
Mr. G. B. Thomas
Associate Professor J. F. D. Wood
Dr. H. S. Wyndham

Buildings and Equipment Committee.
Dr. W. E. Clegg (Chairman)
The Vice-Chancellor
Mr. R. C. Gibson
The Hon. W. M. Gollan
Mr. H. F. Heath
Captain G. I. D. Hutcheson
The Hon. R. A. King
Mr. W. R. Laurie
Dr. J. K. MacDougall
Professor C. H. Munro
Professor D. W. Phillips
Mr. A. A. Robinson

Library Committee.
Mr. W. G. Kett (Chairman)
The Vice-Chancellor
Mr. L. S. Baker
The Hon. J. J. Maloney
Professor D. W. Phillips
Mr. G. B. Thomas

Public Relations Committee.
Mr. R. J. Webster (Chairman)
The Vice-Chancellor
Mr. F. W. Ayscough
Mr. J. N. Barrett
Mr. H. G. Conde
Captain G. I. D. Hutcheson
The Hon. J. J. Maloney
Mr. F. M. Mathews
Mr. R. G. C. Parry-Okeden

Appeals Committee.
The Chancellor (Chairman)
The Deputy Chancellor
Member of Council nominated by association representing staff members or member of Council nominated by appellant students.
LECTURING STAFF.

Faculty of Science.

School of Biological Sciences.

Associate Professor of Biochemistry—B. J. F. Ralph, B.Sc. Tas., Ph.D. Liv., A.R.A.C.I.

Senior Lecturer.

Lecturers.
R. K. Crowden, B.Sc., Tas.
Miss M. M. Hindmarsh, B.Sc., Ph.D. Syd.
E. Shipp, B.Sc. Syd.
Mrs. E. M. Stephenson, M.Sc. N.Z., Ph.D. Lond.

School of Chemistry.

Professor of Inorganic Chemistry—D. P. Mellor, D.Sc. Tas., F.R.A.C.I.

Associate Professor of Organic Chemistry—S. J. Angyal, Ph.D. Bud., F.R.A.C.I.

Senior Lecturers.
N. R. Davies, B.Sc., Ph.D. Lond., F.R.I.C.
G. Shaw, B.Sc., Ph.D. Lond., D.I.C., A.R.C.S.
Lecturers.

J. L. Courtney, B.Sc., A.S.T.C., A.R.A.C.I.
J. H. Green, M.Sc. Qld., Ph.D. Cantab.
C. M. Harris, B.Sc., Ph.D., A.S.T.C., A.R.A.C.I.
Mrs. S. L. Lowy, Ph.D. Vienna, A.R.A.C.I.
E. S. Swinbourne, B.Sc., A.S.T.C., A.R.A.C.I.

Teaching Fellows.

V. Cranmer, B.Sc., A.S.T.C.
G. E. Hibberd, A.S.T.C.
Miss A. E. Jane, B.Sc. Syd.
S. R. Johns, B.Sc. N.E.
E. A. Magnusson, B.Sc. Lond.
Miss M. H. Maguire, B.Sc. Syd., Ph.D.
R. Naylor, B.Sc. Tas.
R. N. Warrener, B.Sc. Syd.
R. J. Young, B.Sc. Syd.

School of Mathematics.

Professor of Mathematics—G. Bosson, M.Sc. Lond.

Senior Lecturers.


Lecturers.
Mrs. E. Bofinger, B.Sc. Syd.
J. St.A. Sandiford, B.Sc. Syd.

School of Physics.
Professor of Physics—C. J. Milner, M.A., Ph.D. Cantab., F.Inst.P., Dean of the Faculty of Science.

Associate Professor of Physics—G. H. Godfrey, M.A., B.Sc. Syd., F.Inst.P.

Senior Lecturers.
J. Lederer, B.Sc. Syd., M.Sc., A.S.T.C., F.I.O.
R. E. Lishmund, B.Sc., Ph.D. St. And., A.Inst.P.

Lecturers.
G. Amigo, B.Sc., A.S.T.C.
L. O. Bowen, B.Sc., B.E. W.Aust., M.Sc.
C. R. Brown, B.Sc., A.S.T.C., F.I.O.

Teaching Fellow.
K. H. Marsden, B.Sc. Lond., A.R.C.S.
Faculty of Engineering.

School of Civil Engineering.


Senior Lecturers.


A. S. Hall, B.Sc.(Eng.) Lond., D.I.C., A.M.I.E.Aust., A.Am.Soc.C.E.

J. L. Jenkins, B.E. Syd., A.S.T.C.

A. F. S. Nettleton, B.Sc., B.E. Syd.


C. J. Weisner, B.Sc. Adel.


Lecturers.


H. J. Brettle, B.E. Syd., A.S.T.C.

J. R. Burton, B.E. Syd.


A. G. Douglas, B.E.


H. K. Fischer, Dipl.Ing. Hanover, A.M.S.E.


D. T. Howell, B.E. Syd.

P. B. Jones, B.E. Syd.

E. M. Kitchen, B.E. Syd.

E. M. Laurenson, B.E.

D. C. O'Connor, B.E.

L. V. O'Neill, B.E. Syd.

B. J. F. Patten, B.E. Syd.

P. Shuleshko, M.Sc., B.E., Regensburg.

I. J. Somervaille, B.E., A.S.T.C.


Teaching Fellows.
A. E. Crimp, B.E. N.Z.
K. A. Faulkes, B.E.
P. W. Throsby, B.E. Syd.
J. J. Toomey, B.E. Syd.
R. F. Warner, B.E.

School of Electrical Engineering.

Senior Lecturers.
E. L. Mortimer, B.Sc.(Eng.) Loud., A.M.I.E.E.

Lecturers.
H. N. Edwardes, B.Sc., B.E. Syd.
P. J. Gillespie, B.Sc., B.E. Syd.
C. St.J. Lamb, B.E., A.S.T.C.
F. Lewin, B.Sc., B.E. Syd.
R. G. Smart, B.E.

Teaching Fellow.
C. W. Thomas, B.Sc. Qld.

School of Highway Engineering.
SCHOOL OF MECHANICAL ENGINEERING.


Senior Lecturers.


J. Munro, B.E. Syd., M.I.Mar.E.(Lond.).


Lecturers.

G. Bennett, A.S.T.C.


R. A. A. Bryant, A.S.T.C., Grad.I.E.Aust.

N. Cooke, B.Sc. Lond., A.S.T.C., A.M.I.Prod.E.

H. S. Craddock, B.E. Syd.


E. W. Dodds, A.F.R.Ae.S.


E. C. Hind, A.S.T.C.

A. K. James, A.S.T.C.


N. Rosenauer, M.E. St. Petersburg, Dr.Ing. Riga, A.M.I.E.Aust.

C. M. Sapsford, B.Sc. (Eng.) Lond., A.M.I.E.Aust., G.I.Mech.E.
Lecturers—continued.

H. E. Wulff, Dipl.Ing. Cologne.

Teaching Fellow.

R. K. Pillay, B.E.

School of Traffic Engineering.

Professor of Traffic Engineering—W. R. Blunden, B.Sc., B.E.
Syd., A.M.I.E.Aust., A.Inst.P.

Faculty of Technology.

School of Chemical Engineering.

Professor of Chemical Engineering—J. P. Baxter, O.B.E., B.Sc.,

Associate Professor of Food Technology—F. H. Reuter, Dr.phil.
Berl., F.R.I.C., F.R.A.C.I.

Senior Lecturers.


Lecturers.

R. A. Edwards, B.Sc., A.S.T.C.
F. O. Howard, B.E. Syd.
B. G. Madden, B.Sc., A.S.T.C.
J. R. Norman, B.Sc.
J. D. Smith, B.Sc., A.S.T.C., A.R.A.C.I

Teaching Fellows.

R. E. O. Beattie, B.Sc., A.S.T.C.
R. O. Prince, B.Sc., A.S.T.C.
H. T. Stoddart, B.Sc., A.S.T.C.
SCHOOL OF METALLURGY.


Senior Lecturers.

Lecturers.
M. Hatherly, M.Sc., A.S.T.C.
F. Lawson, B.Sc., A.S.T.C.
P. G. McDougall, B.Sc., A.S.T.C.
V. J. Moran, B.Sc., A.S.T.C., A.M.Aus.I.M.M.
N. A. Warner, B.Sc.

SCHOOL OF MINING ENGINEERING AND APPLIED GEOLOGY.


Senior Lecturers.

Lecturers.
A. D. M. Bell, B.Sc. Lond.
J. C. Cameron, M.A., B.Sc. Edin.
D. R. Cooley, B.E.

Teaching Fellows.
W. E. Baker, B.Sc. Tas.
Miss P. A. Males, F.G.A.A.
School of Textile Technology.


Senior Lecturers.

Lecturer.

School of Wool Technology.


Lecturers.

Teaching Fellow.

Faculty of Architecture.

School of Architecture and Building.


Senior Lecturers.
G. H. B. McDonell, B.Arch. Syd., F.R.A.I.A.
R. O. Phillips, B.Arch. Syd., M.Arch., A.R.A.I.A.

Lecturers.
N. F. Bazeley, A.S.T.C (Arch.).
E. C. Daniels, A.S.T.C. (Arch.), A.R.A.I.A.
M. J. Dunphy, F.R.A.I.A.
Miss L. M. Nimmo, A.S.T.C. (Art), A.W.C.I.
E. C. Parker, A.S.T.C. (Arch.), A.R.A.I.A.
J. Styles, A.S.T.C.(Arch.), A.R.A.I.A.
R N. Thackray, A.A.I.B.
Faculty of Commerce.

School of Accountancy.

Professor of Accountancy—E. B. Smyth, F.A.S.A., A.C.I.S., A.S.T.C., A.F.A.I.M.

Lecturers.
R. L. Bowra, LL.B. Syd., A.I.C.A., A.A.S.A.
L. A. McPherson, A.A.S.A., A.C.I.S.

School of Economics.

Professor of Economics—D. C. Rowan, B.A. Bristol.

Lecturers.
J. D. Pitchford, M.Com.Tas.
N. Runcie, B.Ec. Syd.

School of Hospital Administration.


Faculty of Humanities and Social Sciences.

School of Humanities and Social Sciences.

English.

Senior Lecturers.

Lecturers.
A. M. Gingis, B.A. Syd. (on leave).
PHILOSOPHY.

Senior Lecturer.

Lecturers.
D. C. Stove, B.A. Syd.

HISTORY.

Senior Lecturer.
N. B. Nairn, M.A. Syd. (on leave).

Lecturers.
K. J. Cable, B.A. Cantab., M.A. Syd.
S. M. Ingham, M.A. Melb.
D. R. G. Packer, M.A., Melb.

GOVERNMENT.

Lecturer.

SCHOOL OF APPLIED PSYCHOLOGY.

Professor of Applied Psychology—J. F. Clark, M.A., B.Sc.,

Senior Lecturers.
E. E. Davies, M.A. Syd.

Lecturers.
Mrs. B. M. Anderson, M.A. N.Z., Ph.D. Lond.
G. Fitzgerald, M.A. Col.
C. P. Kenna, B.A., B.Sc. Syd.
J. C. Murray, B.A. Syd.
A. K. Olley, B.A. Syd.
ADMINISTRATIVE STAFF.

Vice-Chancellor.

Pro-Vice-Chancellor.

Registrar.

Accountant—E. H. Davis, A.A.S.A., A.C.I.S.

Purchasing Officer—J. G. Hart.


DIVISION OF THE REGISTRAR.


Secretary to Council and Assistant Registrar—J. S. Fraser.

Assistant Registrar—R. E. Pert, B.A., Syd.

Public Relations Officer—G. Caiger, M.A. Oxon.

Supervisor of Amenities and Manager of Hostel—Major R. K. Withew.


Clerical—K. Barry; F. S. Symes, B.A. Syd.; G. T. Bradshaw.

DIVISION OF THE BURSAR.

Assistant Bursar (Buildings and Grounds)—R. G. Sutton, A.S.T.C.(Bldg.), A.A.I.B.

Assistant Bursar (Personnel)—L. T. Bond, I.I.B. Syd., A.A.S.A.

Catering Manager—M. J. Martin.

Clerical—A. S. Veitch; Miss V. M. McCallum; K. M. Gibson; T. J. Charles; Miss M. A. Dwyer; Miss V. Fisher; A. M. McNamara.
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.
  J. J. Holloway.
  L. Lehoczky, M.D. Szeg.
  G. G. McPherson.
  W. R. Sadler.
  J. P. Stuart.

School of Chemistry.

Laboratory Manager.

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

Technical Officers.
  J. Klavins, A.R.A.C.I.
  V. A. Pickles, A.S.T.C., A.R.A.C.I.
  I. H. Reece, B.Sc., A.S.T.C.
  N. Sinicins, Dr. Chem. Ing. Riga.
  D. G. Weeden, A.S.T.C.
School of Physics.

Technical Officers.
- J. W. Bolin.
- H. Hofer, Ph.D. Vienna.
- C. J. Tenukest.

Faculty of Engineering.

School of Civil Engineering.

Technical Officers.
- D. N. Body, A.S.T.C.
- R. A. Duncan, A.S.T.C.
- D. E. Hattersley, A.S.T.C.
- F. G. Keller, Dipl.Ing. Vienna.
- D. W. Marr, A.S.T.C.
- J. F. Smith, B.E. Syd.
- K. A. Smith, A.S.T.C.
- F. A. J. Stein, B.E.

School of Electrical Engineering.

Laboratory Manager.

Technical Officers.
- G. Choy, B.E.
- R. N. Duffy, A.S.T.C.
- Miss M. E. Oates, B.A. Syd.
- D. Vasilescu, A.S.T.C.

School of Mechanical Engineering.

Technical Officers
- U. Barda, A.S.T.C.
- G. H. Cumming, A.S.T.C.
- W. Dollar, A.S.T.C.
- J. N. G. Grant, Per.Ind. Leghorn.
- J. C. A. Greenfield, Dip.Agr. N.Z.
- J. P. Moreton, B.E.
- A. W. Roberts, B.E., A.S.T.C.
Faculty of Technology.

School of Chemical Engineering.

Laboratory Manager.
J. G. Donnellan, A.S.T.C., A.R.A.C.I.

Technical Officers.
J. R. Gatenby, A.S.T.C.
C. L. Samways, B.Sc. Syd.

School of Metallurgy.

Technical Officers.
B. Harris, B.Sc. Syd.
J. M. Newburn, A.S.T.C.
R. G. Robins, B.Sc.
A. F. Sievers, A.S.T.C.

School of Mining Engineering and Applied Geology.

Technical Officers.
G. T. See, B.Sc., A.S.T.C.
L. L. Waterhouse, B.E.

School of Wool Technology.

Technical Officers.
E. P. Gohl, B.Sc.
D. B. Hughes, B.Sc.

Faculty of Humanities and Social Sciences.

School of Applied Psychology.

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


LECTURING STAFF.

Faculty of Science.

School of Chemistry.

Senior Lecturer.


Lecturers.


E. C. Watton, A.S.T.C.

School of Mathematics.

Senior Lecturer.

I. L. Rose, B.E. Syd.

Lecturers.

J. A. Lambert, B.Sc. Syd.


M. Temple, M.A. Dub.


School of Physics.

Senior Lecturer.


Lecturers.


Teaching Fellow.

J. E. Cleary, B.Sc.

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Faculty of Engineering.

School of Civil Engineering.
Senior Lecturer.

Lecturers.

School of Electrical Engineering.
Senior Lecturer.

Lecturers.
H. Harrison, B.Sc., B.E. Syd.

School of Mechanical Engineering.
Senior Lecturer.

Lecturers.
M. J. Hallinan, A.S.T.C.

Faculty of Technology.

School of Chemical Engineering.
Senior Lecturer.

Lecturers.
W. G. Kirchner, M.Sc., A.S.T.C., A.R.A.C.I.

School of Metallurgy.
Lecturers.
C. H. Cooke, A.S.T.C., A.I.M. (Lond.).
J. E. McLennan, A.S.T.C.

School of Mining Engineering and Applied Geology.
Lecturers.
B. A. Engel, B.Sc. N.E.
A. S. Ritchie, A.S.T.C.
Faculty of Humanities and Social Sciences.
Department of Arts.

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

Senior Lecturer.
G. A. Cranfield, B.A., Ph.D. Cantab.

Lecturers.
J. P. S. Bach, M.A. Syd.
T. R. Reese, B.A. Sheff., Ph.D. Lond.

ECONOMICS.
Associate Professor of Economics.

Lecturer.
R. W. Peters, B.A. W.Aust., A.C.I.A.A.

Teaching Fellows.
M. Bernasek, B.Ec. Syd.

CLASSICS.
Senior Lecturer.
J. Duhigg, B.A. Syd., M.A. Cantab.

Lecturer.
G. V. Sumner, M.A. Oxon.

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.
B. V. Share, B.Litt., M.A. Dub.

Teaching Fellow.
Miss R. K. Iverach, B.A. Syd.
FRENCH.

Senior Lecturer.

Lecturer.

GERMAN.

Senior Lecturer.
O. Spindler, Dr.phil., Dip.Ed. Vienna.

Lecturer.
G. K. Connolly, B.A. Melb., Dr.phil. Vienna.

PHILOSOPHY.

Senior Lecturer.
C. F. Presley, B.A. Wales, B.Litt. Oxon.

Lecturer.

PSYCHOLOGY.

Senior Lecturer.
D. R. Martin, B.A. Syd.

Lecturers.
Miss I. A. Edmonds, M.A. Syd.
A. C. Hall, B.A. Reading.

GEOGRAPHY.

Senior Lecturer.
A. D. Tweedie, M.A. N.Z.

Lecturer.
K. W. Robinson, M.A. N.Z.

Teaching Fellow.
M. G. A. Wilson, M.A. N.Z.

TECHNICAL STAFF.

SCHOOL OF CIVIL ENGINEERING.

Technical Officer.
A. Pattison, A.S.T.C.
SCHOOL OF MECHANICAL ENGINEERING.

Technical Officer.
G. D. Butler, 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.

Lecturers.
T. W. Barnes, A.S.T.C. (Metallurgy), A.R.A.C.I.

Technical Officer.
R. Rudzats.

SCHOOL OF ELECTRICAL ENGINEERING.

Senior Lecturer.

Lecturer.
W. H. Charlton, A.S.T.C., A.M.I.E.E.

SCHOOL OF MATHEMATICS.

Lecturer.

SCHOOL OF MECHANICAL ENGINEERING.

Senior Lecturer.

Lecturers.
G. T. Csanady, Dipl.Ing. Munich.
R. W. Upfold, B.E., A.S.T.C.

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


School of Chemistry.
Lecturer.

Technical Officer.
B. Santich, A.S.T.C.

School of Electrical Engineering.
Lecturer.

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

School of Mechanical Engineering.
Lecturer.

SYDNEY TECHNICAL COLLEGE.

(Staff seconded to the University under the provisions of Section 34 of the Technical Education and New South Wales University of Technology Act, 1949-1955.)

School of Applied Psychology.
L. M. Haynes, B.A. Syd.

School of Architecture and Building.
A. A. Jack, A.S.T.C., A.A.I.B.
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, 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 New South Wales University of Technology 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 Science (Optometrical Science), Bachelor of Science in Psychology, Bachelor of Engineering, Bachelor of Engineering (Geology), Bachelor of Surveying, Bachelor of Architecture, and Bachelor of Commerce.

First Degree Courses.

Bachelor of Science.

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

Bachelor of Engineering.

Two first degrees are awarded, namely, Bachelor of Engineering and Bachelor of Engineering (Geology). The degree of Bachelor of Engineering may be taken by completing courses specialising in Mechanical Engineering, Electrical Engineering, Mining Engineering, 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 or Applied Psychology (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 of the University of New England, 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 “Syllabuses for Undergraduate Courses”.

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 of Technology 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 of Technology 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 student 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 Architecture, Master of Hospital Administration or Doctor of Philosophy in Science, Engineering, or Architecture. Conditions for the award of these degrees are set out on pages 103 to 114 of the 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 1957 is advertised separately.

Fees.

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, fees for part-time courses 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.

In addition, all students enrolling for the first time in courses in categories (i) and (ii) 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.

(b) Arts Courses (Newcastle)*.

(i) Pass—£24 per annum per subject or £8 per term per subject.

* Arts students at Newcastle are also required to pay the following fees for transmission to the University of New England—Matriculation Fee £3, Examination Fee £3 (annually), Graduation Fee £3.
(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.

Higher Degrees.

(a) Master of Science, Engineering or Architecture.

(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) 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.

Late Fees.

(a) Any student who enrolls after the third week of any term, irrespective of whether he/she is responsible for the payment of his/her fees, shall be charged a late fee of £1 per term.

(b) The late fee will be increased to £2 in the case of enrolments effected after 31st March (1st term), 30th June (2nd term), and 30th September (3rd term).

University of Technology Students' Union.

Annual subscription, £1 4s. (compulsory for all registered students).

N.S.W. University of Technology Sports Association.

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

It is pointed out that fees are payable on a term basis. Students who find difficulty in paying the annual fee are advised—

(i) to pay the terminal fee by the appointed date;

(ii) that any application for extension of time in which to pay fees due (a maximum of one month may be permitted) must be submitted in writing to the Registrar before the date on which late fees are payable.

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. In the case of full-time degree courses, students should enrol during Enrolment Week at the commencement of the academic year. In the case of part-time degree and diploma courses, enrolment forms must be obtained from the Enrolling Officer of the appropriate School during the third term of the preceding year, when directions as to the subsequent procedure to be followed will be given.

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 103 to 114 of this Calendar.
STUDENT HOSTEL.

Single room accommodation is now available for approximately 200 students in a hostel on the University site at Kensington.

Terms are weekly in advance, the fee being £4 per week. This fee covers full board and residence (excluding personal laundry). A deposit of £1 is also required for the room key which is refunded on completion of residence after all dues have been paid and all equipment returned.

Students wishing to reside at the hostel should make application to the Supervisor of Amenities, Major R. K. Wilthew, Box 24, P.O., Kensington.

GUIDANCE OFFICE.

Through the Guidance Office a general educational and vocational counselling service is provided to all students and prospective students of the University. These activities may be indicated under the following headings:—

1. Student Counselling Service.

For the prospective student, 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 guidance officer may thus assist in the choice of a career, firstly discussing with the prospective student the relation between his previous educational attainments, assessed abilities, special aptitudes and interests and the demands of the many University courses offering and, secondly, by facilitating contact with other sources of information and advice.

Each student of the University is therefore invited to discuss with a guidance officer at any time during his course, his methods of study, his general adjustment to the course and other factors complementary to the normal relationship existing between him and his lecturers and of significance to his progress in his chosen course—e.g., a distracting personal problem.

An appointment may be arranged personally or by telephone.

2. Educational and Occupational Information Service.

Information concerning training facilities within the University, the N.S.W. Department of Technical Education and other training institutions may be regarded as essential for a person's proper choice of, and adjustment and success in, a particular vocation. For this reason, the Guidance Office provides facilities for answering enquiries concerning—
(a) Courses of training offered, e.g. types, duration, entrance and occupational requirements, fees and special conditions applicable.

(b) Financial assistance in studies, e.g. scholarships, bursaries, exhibitions.

(c) Occupational Information.—Information booklets concerning a wide variety of occupations are available. These cover such points as methods of entry, fees, methods of training, prospects, personal qualifications needed and descriptions of the actual work involved in a particular vocation. Quite often it is necessary for arrangements to be made for enquiries to be referred for detailed advice on particular vocations to experts in the respective teaching departments.

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. In the case of certificates a copy should accompany the original, as this will allow the immediate return of the original document.

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, New South Wales University of Technology, Broadway, Sydney, clearly stating details of their educational standing.

(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 close liaison should be maintained with the Guidance Office until the English language requirement has been satisfied.

(d) Landing Permits—

The Guidance Office (or the University of Technology or the Technical Education Department) 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.

5. Location and Hours of Guidance Office.

At Sydney the Guidance Office is located at 45-47 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 M1281.

LIBRARY.

A library, servicing courses conducted at Kensington, is situated in the main building on that site. 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.
REQUIREMENTS FOR ADMISSION.

1. A candidate for any degree of the New South Wales University of Technology 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.

Group B.—Applied Mathematics, Theory and Practice of Music, General Mathematics, Mathematics I, Mathematics II, or Descriptive Geometry and Drawing.

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

(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:

<table>
<thead>
<tr>
<th>Part-time degree subject.</th>
<th>Pre-requisite subject at Leaving Certificate, Qualifying, Qualifying (Deferred), Matriculation or equivalent examination.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.11 Mathematics</td>
<td>Mathematics I and Mathematics II.</td>
</tr>
<tr>
<td>10.11a Mathematics</td>
<td>Physics or Honours at L.C. examination in combined Physics and Chemistry.</td>
</tr>
<tr>
<td>1.11 Physics</td>
<td>Chemistry or Honours at L.C. examination in combined Physics and Chemistry.</td>
</tr>
<tr>
<td>1.41 Physics</td>
<td></td>
</tr>
<tr>
<td>1.41d Physics</td>
<td></td>
</tr>
<tr>
<td>2.41 General Chemistry</td>
<td></td>
</tr>
</tbody>
</table>
Part-time degree subject.

11.101 Theory of Structures

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

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

Mathematics I or Mathematics II or General Mathematics.

(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 New
South Wales University of Technology, will be permitted to complete their qualifications to enter the University of Technology 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 Technology 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 Technology, but this provision shall not apply to examinations held later than March, 1959.

(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 Technology, may be admitted to the University of Technology 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 Technology 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 Technology, 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 New South Wales University of Technology.
4. Any person qualified to enter a degree course in the University of Technology in terms of the preceding By-laws shall become a "registered student" of the University of Technology 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 Technology 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 New South Wales University of Technology.

Many 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.

Mining Scholarships.

A number of scholarships tenable in Mining Engineering, Mechanical Engineering or Electrical Engineering are offered by the Joint Coal Board and the Australian Coal Association (Research) Limited. Each scholarship holder is required to sign a bond undertaking to remain in the New South Wales coal mining industry for a period of three years after graduation.

The values of the scholarships are as follows:

### Joint Coal Board.

<table>
<thead>
<tr>
<th>Basic Rate.*</th>
<th>Fees</th>
<th>Books</th>
<th>Instruments</th>
<th>Students Residing Away from Home</th>
<th>Total Value.</th>
</tr>
</thead>
<tbody>
<tr>
<td>£ s. d.</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£ s. d.</td>
</tr>
<tr>
<td>1st year—279 10 0 ... ...</td>
<td>90</td>
<td>12</td>
<td>10</td>
<td>65</td>
<td>456 10 0</td>
</tr>
<tr>
<td>2nd year—305 10 0 ... ...</td>
<td>90</td>
<td>12</td>
<td>...</td>
<td>65</td>
<td>472 10 0</td>
</tr>
<tr>
<td>3rd year—331 10 0 ... ...</td>
<td>90</td>
<td>12</td>
<td>...</td>
<td>65</td>
<td>498 10 0</td>
</tr>
<tr>
<td>4th year—357 10 0 ... ...</td>
<td>90</td>
<td>12</td>
<td>...</td>
<td>65</td>
<td>524 10 0</td>
</tr>
</tbody>
</table>

### Australian Coal Association (Research) Limited.

<table>
<thead>
<tr>
<th>Basic Rate.*</th>
<th>Fees</th>
<th>Books</th>
<th>Instruments</th>
<th>Students Residing Away from Home</th>
<th>Total Value.</th>
</tr>
</thead>
<tbody>
<tr>
<td>£ s. d.</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£ s. d.</td>
</tr>
<tr>
<td>1st year—280 11 8 ... ...</td>
<td>90</td>
<td>12</td>
<td>10</td>
<td>52</td>
<td>444 11 8</td>
</tr>
<tr>
<td>2nd year—306 11 8 ... ...</td>
<td>90</td>
<td>12</td>
<td>...</td>
<td>52</td>
<td>460 11 8</td>
</tr>
<tr>
<td>3rd year—332 11 8 ... ...</td>
<td>90</td>
<td>12</td>
<td>...</td>
<td>52</td>
<td>486 11 8</td>
</tr>
<tr>
<td>4th year—358 11 8 ... ...</td>
<td>90</td>
<td>12</td>
<td>...</td>
<td>52</td>
<td>512 11 8</td>
</tr>
</tbody>
</table>

* Weekly equivalent.

Note.—The Joint Coal Board scholarships cover, in addition, expenses of compulsory geology and survey camps, and fees for membership in the Students’ Union and the Sports Association.

Particulars and application forms for these scholarships can be obtained from the Guidance Office, Broadway, Sydney.
Mining and Metallurgical Bursaries Fund.

1. The Mining and Metallurgical Bursaries Fund provides for the award of bursaries to students proceeding to the degree of Bachelor of Engineering in Metalliferous Mining or Metallurgy or 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 New South Wales University of Technology are eligible to apply for Commonwealth scholarships. Open Entrance Scholarships 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 is 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 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 £169 per annum for a student living with his parents, and £240 10s. 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 £600 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 £100 for the first dependent child under 16 years of age (other than the applicant) and £50 for each other dependent child under 16 years of age. Where the adjusted family income exceeds £600, the amount of living allowance payable abates at the rate of £3 for every £10 by which the adjusted family income exceeds
£600. Thus, if the living allowance is to be payable in any particular case the adjusted family income must be less than (i) £1,150 if the student is living at home or (ii) £1,388 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 £1 10s. 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 all Commonwealth scholarships is 30th November of the year immediately preceding the year for which the scholarship is desired. 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 MW2911.)

New South Wales Public Service Board Traineeships.

The N.S.W. Public Service Board award a number of traineeships in Civil and Mechanical Engineering, Wool Technology, Applied Chemistry and Applied Geology. 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—
£209 per annum if living at home,
£338 per annum if living away from home.

3rd year—
£256 per annum if living at home.
£394 per annum if living away from home.

4th and subsequent years—
£282 per annum if living at home,
£422 per annum if living away from home.

On reaching the age of 21 years, the trainee receives an allowance at the rate of £310 per annum if living at home or £450 per annum if living away from home.

Married students receive £450 per annum, plus 15s. per week for dependent wife and 10s. per week for each child.

During industrial training periods salaries are paid in accordance with the appropriate agreements.
The Public Service Board also award 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 £375 (1st year) to £634 (5th year) if living at home.

Rates ranging from £427 (1st year) to £690 (5th year) if living away from home.

Adults—

Rates ranging from £553 (first three years) to £646 (5th year) if living at home.

Rates ranging from £609 (first three years) to £702 (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 £52 per annum (£75 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 £1,125 if there are three or fewer dependents, with an increase in the permissible family income of £80 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 provided they have had at least one year's service and have satisfactorily completed the technical course set down for that period.

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—

<table>
<thead>
<tr>
<th>Year of Tenure</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year of tenure</td>
<td>£100</td>
</tr>
<tr>
<td>Second year of tenure</td>
<td>£150</td>
</tr>
</tbody>
</table>
(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.

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 N.S.W. University of Technology 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.
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.

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 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) 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 first of these was made possible by Mauri Brothers and Thomson Limited. The following conditions apply:—

1. 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 full-time Food Technology degree course, during the years when that course requires full-time attendance at the University.

2. The scholarship shall be tenable at the N.S.W. University of Technology 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.

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

4. 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.

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

6. Applications for the scholarship shall be lodged with the Registrar by 31st December.

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.

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 £825 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 ICIANZ,
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 ICIANZ 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 £825.

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 31st December in 1958 and each alternate year thereafter.

The Monsanto Research Scholarship.

Monsanto Chemicals (Australia) Ltd. has established a scholarship for research in Chemical Engineering to the value of £700 per annum. The scholarship will be awarded under the following rules:

1. The scholarship shall be known as the Monsanto Research Scholarship.

2. It shall be open for award each year, normally in February, from applications lodged with the Registrar by December 31st of the previous year. Awards shall be made by the Professorial Board on the recommendation of the Professor of Chemical Engineering, after consultation with Monsanto Chemicals (Australia) Ltd.

3. The scholarship shall have an annual value of £700, of which a minimum of £550 shall be paid to the scholar as his emoluments and the remaining £150 to the scholar or to the University towards meeting the expenses connected with the scholar’s work, this to be at the discretion of the University.

4. The scholarship shall be awarded for research in Chemical Engineering, the subject of the research to be approved by the Professor of Chemical Engineering and to be carried out under his direction.
5. The scholarship shall be tenable at the New South Wales University of Technology for a period of one year, but may be re-awarded for a second, though not for a further year. The scholar's tenure shall at all times be subject to his work being satisfactory to the Professor of Chemical Engineering.

6. Scholars shall be required to devote their full time to research, save that they will be permitted to undertake a limited amount of demonstrating work at the University.

7. Candidates for the scholarship shall be graduates in science or engineering (preferably having completed a four-year course) of an Australian University or have at least equivalent qualifications. They should have a good scholastic record and show some aptitude for research. Personality and leadership qualities shall also be taken into consideration.

8. The scholar shall forward a copy of any written account of his research work to the library of Monsanto Chemicals (Australia) Ltd. and shall have the right to publish the results of his research.

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 £500, 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 14th December, and should be lodged with the Company at 95 Collins Street, 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 as submission for 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.
Wool Industry Fund Scholarships.

Four scholarships financed from the Wool Industry Fund established by the Commonwealth Government are available for students attending the Wool Technology or Textile Technology degree courses. The value of the scholarships ranges from £352 to £602 per annum, continued tenure being subject to satisfactory progress. Further information may be obtained from the Registrar, with whom applications should be lodged not later than 31st January.

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.

*5112-4 K5137
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.

Commonwealth Public Service Cadetships.

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

<table>
<thead>
<tr>
<th>Age (in years)</th>
<th>Salary (p.a.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 19</td>
<td>£445</td>
</tr>
<tr>
<td>At 19</td>
<td>£542</td>
</tr>
<tr>
<td>At 20</td>
<td>£638</td>
</tr>
<tr>
<td>At 21</td>
<td>£747</td>
</tr>
<tr>
<td>At 22</td>
<td>£792</td>
</tr>
<tr>
<td>At 23</td>
<td>£837</td>
</tr>
<tr>
<td>Rising by two increments</td>
<td>£927</td>
</tr>
</tbody>
</table>

Fees are refunded to the cadet on a proportionate basis according to his salary: a full refund is given up to and including the £638 p.a. salary rate, a 75 per cent. refund in the range £747 to £792 p.a., and a 50 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. Either full-time or part-time courses may be undertaken if available.

In 1957, Cadetships will be offered in the following fields:

- Postmaster-General’s Department—Cadet Engineers or Cadet Draftsmen.
- Department of Works—Cadet Architects or Cadet Engineers.
- Department of Defence Production—Cadet Engineers.

Further information can be obtained from the Employment Officer, Commonwealth Public Service Inspector’s Office, 119 Phillip Street, Sydney (Telephone BW 5701).

Rural Bank Fellowship in Agricultural Engineering.

The Rural Bank of New South Wales provides a fellowship for post-graduate research in agricultural engineering, tenable at the University of Technology. The successful applicant must be an Honours graduate who is interested in the engineering problems of...
the primary industries, and will be required to pursue research under
the general direction of the Professor of Mechanical Engineering. The Fellowship is valued at £334-£987 per annum, with a possible
maximum of £1,159 per annum for persons of exceptional qualifica-
tions and experience.

Further information may be obtained from the Professor of Mech-
anical Engineering. Applications should be made to the Bursar by
15th October in the year preceding the year of award.

The Australian Atomic Energy Commission Post-graduate Research
Studentships.

The Australian Atomic Energy Commission awards studentships
tenable at the N.S.W. University of Technology to suitable
University graduates desiring to undertake research work within
fields of importance to Australia's programme of atomic energy re-
search, 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 dura-
tion, 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 Uni-
versity, and applicants should in the first place consult the Head of
the appropriate School with a view to securing such nomination.

The Australian Atomic Energy Commission Undergraduate
Scholarships.

The Australian Atomic Energy Commission from time to time
invites applications for undergraduate scholarships in fields of impor-
tance 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.

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 N.S.W. University of Technology, five are reserved for allocation by the Australian Vice-Chancellors' Committee and the remainder are tenable in the other Australian Universities.

The following regulations apply:

(1) The Fellowship 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 Professional 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 may be extended, provided
that the maximum duration of the Fellowship shall not extend beyond three years and that the number of fellowship-holders does not exceed twenty-five throughout Australia.

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 N.S.W. University of Technology 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.

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) 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. Successful applicants will receive a salary ranging from £10 3s. 7d. to £13 19s. 4d. per week while continuing their studies and will have most of their fees (including all lecture fees) paid by the Army. 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 FA 0455).
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 New South Wales University of Technology, 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 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 Uni-
versity.
(b) £15 p.a. for students in part-time attendance at the Uni-
versity.
(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 super-
visor 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. Two copies of the thesis shall be bound 
in such manner as allows them transmission to the examiners without 
possibility of disarrangement and the third copy shall be in accord-
ance with the following specification:—

The size of the paper shall be quarto (approximately 10 in. 
× 8 in.) except for drawings and maps on which no restriction 
is placed. There shall be a margin of 1½ in. on the left-hand 
side of each page. The whole is to be arranged in order for 
binding but to be unbound.

* 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.

In order that a successful candidate may have a reasonable chance of 
having his degree conferred at one of the formal degree conferring cere-
monies, 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.
(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 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.

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 New South Wales University of Technology, 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 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. Two copies of the thesis shall

* 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.
be bound in such manner as allows them transmission to the examiners without possibility of disarrangement and the third copy shall be in accordance with the following specification:

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. There shall be a margin of 1\$ in. on the left-hand side of each page. The whole is to be arranged in order for binding but to be unbound.

(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.

CONDITIONS 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 New South Wales University of Technology 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:

(i) Student working externally to the University;
(ii) Student in part-time attendance at the University;
(iii) Student in full-time attendance at the University.

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.
5. 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. Two copies shall be bound in such manner as allows their transmission to the examiners without possibility of disarrangement and the third copy shall be in accordance with the following specification:

The size of the paper shall be quarto (approximately 10 inches x 8 inches), except for drawings, plans and maps, on which no restriction is placed. A margin of 1\frac{1}{2} inches to be left on the left-hand side of each page and the whole to be arranged in order for binding, but to be unbound.

(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.
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 N.S.W. University of Technology 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:

<table>
<thead>
<tr>
<th>Description</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration</td>
<td>£2</td>
</tr>
<tr>
<td>1st year</td>
<td>£90</td>
</tr>
<tr>
<td>2nd year</td>
<td>£30</td>
</tr>
<tr>
<td>3rd year</td>
<td>£30</td>
</tr>
<tr>
<td>Graduation</td>
<td>£3</td>
</tr>
</tbody>
</table>

(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. Two copies shall be bound in such manner as allows their transmission to the examiners without possibility of disarrangement and the third copy shall be in accordance with the following specification:

The size of the paper shall be quarto (approximately 10 inches x 8 inches), except for plans and illustrations on which no restriction is placed. A margin of 1\frac{1}{2} inches to be left on the left-hand side of each page and the whole to be arranged in order for binding, but to be unbound.

(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.

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 New South Wales University of Technology; 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 New South Wales University of Technology 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.

T**hesis.**

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.

E**ntry 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. Three 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. Two copies shall be bound in such manner as allows their transmission to the examiners without possibility of disarrangement, and the third copy shall be in accordance with the following specification:

Size of paper, quarto (approximately 10 inches by 8 inches) except for drawings and maps on which no restriction is placed. A margin of 1¼ inches to be left on the left-hand side of each page, the whole to be arranged in order for binding but to be unbound.

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.

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.
SYLLABUSES FOR UNDERGRADUATE COURSES.

The syllabuses of the courses offered in the various schools are set out in detail 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 undergraduate 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.

Subjects given by the School of Humanities and Social Sciences are denoted by the letter G followed by a distinguishing number.

<table>
<thead>
<tr>
<th>School</th>
<th>Distinguishing Subject Numbers</th>
<th>School Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics</td>
<td>I</td>
<td>1.00 to 1.92</td>
</tr>
<tr>
<td>Chemistry</td>
<td>II</td>
<td>2.00 to 2.73</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>III</td>
<td>3.00 to 3.85</td>
</tr>
<tr>
<td>Metallurgy</td>
<td>IV</td>
<td>4.00 to 4.912</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>V</td>
<td>5.00 to 5.74</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>VI</td>
<td>6.00 to 6.95</td>
</tr>
<tr>
<td>Mining Engineering and Applied Geology</td>
<td>VII</td>
<td>7.00 to 7.703</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>VIII</td>
<td>8.00 to 8.94</td>
</tr>
<tr>
<td>Wool Technology</td>
<td>IX</td>
<td>9.00 to 9.94</td>
</tr>
<tr>
<td>Mathematics</td>
<td>X</td>
<td>10.00 to 10.92</td>
</tr>
<tr>
<td>Architecture and Building</td>
<td>XI</td>
<td>11.00 to 11.96</td>
</tr>
<tr>
<td>Applied Psychology</td>
<td>XII</td>
<td>12.00 to 12.94</td>
</tr>
<tr>
<td>Textile Technology</td>
<td>XIII</td>
<td>13.00 to 13.34</td>
</tr>
<tr>
<td>Accountancy</td>
<td>XIV</td>
<td>14.00 to 14.53</td>
</tr>
<tr>
<td>Economics</td>
<td>XV</td>
<td>15.00 to 15.22</td>
</tr>
<tr>
<td>Hospital Administration</td>
<td>XVI</td>
<td>16.00 to 16.9</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>XVII</td>
<td>17.00 to 17.7</td>
</tr>
<tr>
<td>Department of Production Engineering</td>
<td>XVIII</td>
<td>18.00 to 18.94</td>
</tr>
<tr>
<td>Humanities and Social Sciences</td>
<td>G1 to G70</td>
<td></td>
</tr>
</tbody>
</table>

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 251 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 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 extra-mural 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 118 to 120.

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>Term</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.11</td>
<td>Physics</td>
<td>3 — 3-1*</td>
</tr>
<tr>
<td>1.21</td>
<td>Physical Techniques I</td>
<td>0 — 2</td>
</tr>
<tr>
<td>2.21</td>
<td>Chemical Techniques</td>
<td>0 — 3</td>
</tr>
<tr>
<td>2.41A</td>
<td>General Chemistry</td>
<td>3 — 3</td>
</tr>
<tr>
<td>5.101</td>
<td>Engineering Drawing and Materials</td>
<td>1 — 0</td>
</tr>
<tr>
<td>10.11</td>
<td>Mathematics</td>
<td>4 — 2*</td>
</tr>
<tr>
<td>10.11B</td>
<td>Mathematics</td>
<td>0 — 0</td>
</tr>
<tr>
<td>G10</td>
<td>English</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G20</td>
<td>History</td>
<td>1 — 0</td>
</tr>
</tbody>
</table>

| 14 —14 | 14 —11 | 11 —17 |

SECOND YEAR.

(24 weeks day course.)

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.12</td>
<td>Physics</td>
</tr>
<tr>
<td>1.22</td>
<td>Physical Techniques II</td>
</tr>
<tr>
<td>2.32A</td>
<td>Physical Chemistry</td>
</tr>
<tr>
<td>4.912</td>
<td>Materials Technology</td>
</tr>
<tr>
<td>5.211A</td>
<td>Workshop Processes and Practice</td>
</tr>
<tr>
<td>10.12</td>
<td>Mathematics</td>
</tr>
</tbody>
</table>

9 —14 8 —14

* Tutorial.
**THIRD YEAR.**

*(24 weeks day course.)*

<table>
<thead>
<tr>
<th>Hours per week.</th>
<th>Term 1 lec. lab./tut.</th>
<th>Term 2 lec. lab./tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.13 Physics</td>
<td>6 — 3-1*</td>
<td>6 — 3-1*</td>
</tr>
<tr>
<td>1.23A Physical Techniques III</td>
<td>0 — 0</td>
<td>0 — 3</td>
</tr>
<tr>
<td>1.23B Physical Techniques IV</td>
<td>0 — 3</td>
<td>0 — 3</td>
</tr>
<tr>
<td>1.23c Physical Techniques V</td>
<td>0 — 2</td>
<td>0 — 2</td>
</tr>
<tr>
<td>1.23d Physical Techniques VI</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
<tr>
<td>6.83 Electrical Engineering</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>10.13 Mathematics</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>17 —12</td>
<td>17 —15</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>Hours per week.</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>1.14 Physics</td>
<td>5 — 9-2*</td>
<td>5 — 9-2*</td>
<td>4 — 9-2*</td>
</tr>
<tr>
<td>10.14 Mathematics</td>
<td>6 — 0</td>
<td>6 — 0</td>
<td>6 — 0</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>13 —11</td>
<td>13 —11</td>
<td>10 —11</td>
<td></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 Humanities fourth year degree to be replaced by conversion Humanities ((i) English or History or Philosophy and (ii) Government or Psychology or Economics).

Or

†(b) Successful completion of a part-time course of two years' duration as follows—

<table>
<thead>
<tr>
<th></th>
<th>1st year.</th>
<th>2nd year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics—Lectures</td>
<td>2½</td>
<td>2½</td>
</tr>
<tr>
<td>Physics—Laboratory</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Materials Technology</td>
<td>2½</td>
<td>—</td>
</tr>
<tr>
<td>Conversion Humanities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English or History or Philosophy</td>
<td>2</td>
<td>—</td>
</tr>
<tr>
<td>Government or Psychology or Economics</td>
<td>—</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>11½</td>
<td>11½</td>
</tr>
</tbody>
</table>

CONVERSION COURSE Ic2—OPTOMETRICAL SCIENCE.

Associates of the Sydney Technical College in Optometry may qualify for the award of the degree of Bachelor of Science (Optometrical 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</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>14</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).
B. Conversion Course for holders of 4-year Diploma
(1930-1951).

<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>Conversion Humanities—</td>
<td></td>
</tr>
<tr>
<td>English or History or Philosophy, and</td>
<td></td>
</tr>
<tr>
<td>Psychology or Economics or Government</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

To be taken in two or three years of part-time study, as elected by the student, of approximately 12 or 8 hours per week.
SCHOOL OF CHEMISTRY.

The needs of the chemical industry for men competent to develop, design and operate new processes and to improve existing ones, make essential two different types of training. One need involves a general and fundamental education based on science for those who seek a career in some field in which a sound knowledge of chemistry is important; the other requires a similar training to which is added knowledge of the engineering principles basic to design, construction and operation of plant and equipment.

Training of the first type is provided by the courses in Applied Chemistry, in which students receive instruction in the principles of inorganic, analytical, organic and physical chemistry, supplemented by instruction in mathematics and physics and other scientific subjects. In his final year the student is given the opportunity of electing certain subjects so as to enable him to extend his knowledge in fields of special interest. Training of the second type is provided by the courses in Chemical Engineering, details of which are given on pages 137 to 149.

It should be noted that the work in chemistry, physics and mathematics taken in the first year of the full-time course, and in the first and second years of the part-time course in Applied Chemistry is identical with that taken in the same years of the courses in Chemical Engineering and Metallurgy. Students in any of these courses may 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 of Chemistry offers courses in Science and 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 four years, the fourth year being a two-term year. 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>1.11 Physics</td>
<td>3—3</td>
<td>3—3</td>
<td>3—3</td>
</tr>
<tr>
<td>2.21 Chemical Techniques</td>
<td>0—0</td>
<td>0—0</td>
<td>0—0</td>
</tr>
<tr>
<td>2.41 General Chemistry</td>
<td>3—6</td>
<td>3—6</td>
<td>3—9</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—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></td>
<td>15—14</td>
<td>14—14</td>
<td>10—14</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>1.92 Physics*</td>
<td>1 1/2—0</td>
<td>1 1/2—1 1/2</td>
<td>1 1/2—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>G80 Philosophy</td>
<td>0—0</td>
<td>2—0</td>
<td>2—0</td>
</tr>
<tr>
<td></td>
<td>9 1/2—12 1/2</td>
<td>11 1/2—14</td>
<td>11 1/2—14</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 and 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>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>or *2.64A</td>
<td></td>
<td></td>
<td></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>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 and 2.65B in fourth year.
† The syllabus for the third and four years of the Honours course is set out on pages 123 and 124.
FOURTH YEAR.

(34 weeks of 2 half days and 2 evenings per week.)

<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>2.44 §Inorganic Chemistry</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>
</tr>
<tr>
<td>3.14 *Industrial Chemistry</td>
<td>1½ — 1½</td>
<td>1½ — 1½</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>0 — 0</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

§Alternative Subject—

| 2.65 Applied Organic Chemistry | 1 — 4½ | 1 — 4½ | 1 — 4½ |

(A and B)

* 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 in the long vacation between third and fourth years and in the first term of fourth year.

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>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>2.34 Physical Chemistry</td>
<td>1 — 4½</td>
<td>1 — 4½</td>
</tr>
<tr>
<td>2.44 Inorganic Chemistry</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>
</tr>
<tr>
<td>2.64A Organic Chemistry</td>
<td>1 — 4½</td>
<td>1 — 4½</td>
</tr>
<tr>
<td>2.73 Mathematical Chemistry</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>3.14 Industrial Chemistry*</td>
<td>1½ — 1½</td>
<td>1½ — 1½</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

* Includes Factory visits.
FOURTH YEAR.
(24 weeks day course.)
Second and third terms only—Long vacation and first term in industry.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Term 2</td>
</tr>
<tr>
<td></td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>Applied Organic Chemistry</td>
<td>2 — 8</td>
</tr>
<tr>
<td>Research Project</td>
<td>0 — 10</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td>4 — 18</td>
</tr>
</tbody>
</table>

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>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>Physics, Part I</td>
<td>1 1/2 — 1 1/2</td>
</tr>
<tr>
<td>Chemical Techniques</td>
<td>2 — 4</td>
</tr>
<tr>
<td>General Chemistry, Part I</td>
<td>2 — 1*</td>
</tr>
<tr>
<td>Mathematics, Part I</td>
<td>5 1/4 — 6 1/4</td>
</tr>
</tbody>
</table>

* Tutorial.

SECOND 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>Physics, Part II</td>
<td>1 1/2 — 1 1/2</td>
</tr>
<tr>
<td>General Chemistry, Part II</td>
<td>1 — 2 1/2</td>
</tr>
<tr>
<td>Engineering Drawing and Materials</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Mathematics, Part II</td>
<td>2 — 1*</td>
</tr>
<tr>
<td></td>
<td>6 1/4 — 5</td>
</tr>
</tbody>
</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></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>Physics *</td>
<td>1½ - 0</td>
<td>1½ - 0</td>
<td>1½ - 0</td>
</tr>
<tr>
<td>Physical Chemistry</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Inorganic Chemistry</td>
<td>1 - 2½</td>
<td>1 - 0</td>
<td>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>0</td>
<td>0</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>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>Physical Chemistry</td>
<td>1 - 2</td>
<td>2 - 2½</td>
<td>2 - 2½</td>
</tr>
<tr>
<td>Quantitative Analysis</td>
<td>1 - 2½</td>
<td>1 - 2½</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Industrial Chemistry*</td>
<td>1½ - 3</td>
<td>1½ - 3</td>
<td>3 - 9</td>
</tr>
</tbody>
</table>

* Includes Factory visits.

### 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. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>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>3 - 0</td>
<td>0</td>
</tr>
<tr>
<td>Quantitative Analysis</td>
<td>0 - 0</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>

* First half of term.

† Second half of Term.

Or

### Elective A—

2.34D Physical Chemistry | 1 - 3    | 1 - 3   | 1 - 3   |
2.44D Inorganic Chemistry | 1 - 3    | 1 - 3   | 0        |
2.54D Quantitative Analysis | 0 - 0    | 1 - 3   | 1 - 3   |
2.64D Organic Chemistry | 1 - 3    | 1 - 3   | 1 - 3   |

### Elective B—

2.34D Physical Chemistry | 1 - 3    | 1 - 3   | 1 - 3   |
2.64A Organic Chemistry | 1 - 3    | 1 - 3   | 1 - 3   |
2.65A Applied Organic Chemistry | 1 - 3   | 1 - 3   | 1 - 3   |

Or

2.65B Applied Organic Chemistry (Chemistry and Analysis of Food) | 3 - 9    | 3 - 9   | 3 - 9   |
### 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></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>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</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 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 may be taken over two part-time years or one full-time year.

<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>2.44d Inorganic Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>2.54d Quantitative Analysis</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>Or</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2.65 Applied Organic Chemistry</td>
<td>0 — 10</td>
<td>0 — 10</td>
<td>0 — 10</td>
</tr>
<tr>
<td>Research Project</td>
<td></td>
<td></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>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>1.11 Physics, Part I</td>
<td>1½ — 1½</td>
<td>1½ — 1½</td>
<td>1½ — 1½</td>
</tr>
<tr>
<td>2.21 Chemical Techniques</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
<td>2 — 1*</td>
<td>2 — 1*</td>
<td>2 — 1*</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part I</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>Subject</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics, Part II</td>
<td>1 1/2</td>
<td>1 1/2</td>
<td>1 1/2</td>
</tr>
<tr>
<td>General Chemistry, Part II</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 4</td>
</tr>
<tr>
<td>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></td>
<td>5 1/2</td>
<td>4 1/4</td>
<td>4 1/4</td>
</tr>
</tbody>
</table>

* Tutorial.

THIRD YEAR.
(34 weeks part-time course.)

<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>1 - 0</td>
<td>1 - 0</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Inorganic Chemistry</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Quantitative Analysis</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>1 - 0</td>
<td>1 - 2</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>Light and Heavy Leather Manufacture</td>
<td>2 - 0</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td></td>
<td>7 - 5</td>
<td>6 - 6</td>
<td>6 - 6</td>
</tr>
</tbody>
</table>

FOURTH YEAR.
(34 weeks part-time course.)

<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>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Quantitative Analysis</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</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></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>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>F13 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</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>2.34D Physical Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>2.64D Organic Chemistry</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.13 Biochemistry</td>
<td>0 — 4</td>
<td>0 — 4</td>
<td>0 — 4</td>
</tr>
<tr>
<td>Leather Laboratory</td>
<td>2 — 9</td>
<td>2 — 9</td>
<td>2 — 9</td>
</tr>
</tbody>
</table>

### 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>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</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>2.73 Mathematical Chemistry</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>17.51 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>
</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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.34D Physical Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>or 2.64D Organic Chemistry, depending on the subject taken in the fifth year</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>17.51 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>
</tbody>
</table>
CONVERSION COURSE IIc—APPLIED CHEMISTRY.

Holders of a diploma in Chemistry who completed the course of study prior to 1954 are required to complete the following additional subjects to qualify for the degree of Bachelor of Science:

<table>
<thead>
<tr>
<th>Hours per week.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics, Part II</td>
<td>2</td>
</tr>
<tr>
<td>Physics, Part II</td>
<td>3</td>
</tr>
<tr>
<td>Conversion Humanities— English or History or Philosophy</td>
<td>2</td>
</tr>
<tr>
<td>and Psychology or Economics or Government</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

Plus the presentation of a thesis 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.
Science.*

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 of full-time study or an Honours degree after four years. The course may be taken by part-time study, requiring seven years for the Pass degree.

Students are required to discuss their choice of subjects with the Dean of the Faculty of Science or his representative.

In 1957 the full-time course will be offered at Newcastle and the part-time course at Sydney and Newcastle.

Not all the subjects listed will be available immediately at Newcastle University College so that students at Newcastle will be required, until further notice, to select their courses from the following:

**FIRST YEAR.**

Chemistry I.
Mathematics I.
Physics I.
Geology I.
Geography I.

**SECOND YEAR.**

Chemistry II.
Mathematics II.
Higher Mathematics II.
Physics II.
Geology II.
Geography II.

**THIRD YEAR.**

Chemistry III.
Mathematics III.
Higher Mathematics III.
Physics III.
Geology III.
Geography III.

Part-time students at Newcastle will be required to select their courses from the subjects in the above list with the exception of Higher Mathematics II and III.

*Students commencing the General Science course in 1955 or later years will follow the syllabus as here set out. Students who have completed a stage of the General Science course IIb2 prior to 1955 may, subject to normal progression, follow the syllabus set out in the 1954 Calendar.*
COURSE II—SCIENCE.

Students are required to select their course from the following groups of qualifying subjects in accordance with the provisions set out below.

<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>
</tbody>
</table>

1. (a) HUMANITIES—

- **G10** English .................................................. 1 — 0 1 — 0 2 — 0
- **G20** History .................................................. 1 — 0 1 — 0 2 — 0
- **G30** Philosophy ............................................... 0 — 0 2 — 0 2 — 0
- Social Science Elective ........................................ 2 — 0 2 — 0 0 — 0
- Advanced Elective (Humanities or Social Science) .......... 0 — 0 2 — 0 2 — 0

(b) SCIENCE SUBJECTS—

Group I—

- Chemistry I .................................................... 3 — 4 3 — 4 3 — 4
- Mathematics I .................................................. 4 — 2 4 — 2 4 — 2
- Physics I ....................................................... 3 — 3 3 — 3 3 — 3
- General Biology ............................................... 2 — 4 2 — 4 2 — 4
- Geography I* ................................................... 2 — 3 2 — 3 2 — 3
- Geology I ....................................................... 3 — 4 3 — 4 3 — 4

Group II—

- Chemistry II ................................................... 4 — 8 4 — 8 4 — 8
- Chemistry II* .................................................. 3 — 6 3 — 6 3 — 6
- Mathematics II ................................................ 3 — 2 3 — 2 3 — 2
- Higher Mathematics II ........................................ 7 — 0 7 — 0 7 — 0
- Physics II ...................................................... 4 — 4 4 — 4 4 — 4
- Botany I ......................................................... 3 — 6 3 — 6 3 — 6
- Zoology I ......................................................... 3 — 6 3 — 6 3 — 6
- Geography II* .................................................. 2 — 3 2 — 3 2 — 3
- Geology II ........................................................ 4 — 6 4 — 6 4 — 6
- Theory of Statistics I ........................................ 4 — 3 4 — 3 4 — 3

Group III—

Part (a)—

- Chemistry III .................................................. 4 —10 4 —10 4 —10
- Mathematics III ................................................ 5 — 0 5 — 0 5 — 0
- Higher Mathematics III ....................................... 10 — 0 10 — 0 10 — 0
- Physics III ..................................................... 4 — 8 4 — 8 4 — 8
- Botany II ......................................................... 3 —10 3 —10 3 —10
- Zoology II ....................................................... 3 —10 3 —10 3 —10
- Geography III* ................................................ 2 — 3 2 — 3 2 — 3
- Geology III ...................................................... 5 — 8 5 — 8 5 — 8

Part (b)—

- Biochemistry I ................................................ 3 — 6 3 — 6 3 — 6
- Biochemistry IA ................................................. 3 — 6 3 — 6 3 — 6
- Advanced Inorganic Chemistry ................................ 2 — 8 2 — 8 2 — 8
- Advanced Organic Chemistry ................................ 2 — 8 2 — 8 2 — 8
- Advanced Physical Chemistry ................................ 2 — 8 2 — 8 2 — 8
- Theory of Statistics II ....................................... 4 — 4 4 — 4 4 — 4

* Geography is available at Newcastle University College only.
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 1A;

(b) eight courses selected from the Science subjects listed under Section 1B, 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 candidate may substitute a fourth subject from Group I for a subject from Group II or from Group III Part (b) if the selection of subsidiary subjects is one approved by the Faculty of Science;

(ii) the selected course includes at least two of the subjects Chemistry I, Mathematics I and Physics I;

(iii) the selected course is approved by the Dean of the Faculty of Science;

(iv) the requirements of Section 5 with respect to prerequisite subjects are satisfied;

(v) Biochemistry I, Advanced Inorganic Chemistry, Advanced Organic Chemistry or Advanced Physical Chemistry are taken only in conjunction with Chemistry III;

(vi) Biochemistry IA is taken only in conjunction with Botany II or Zoology II;

(vii) Theory of Statistics I is taken only in conjunction with Mathematics II or Higher Mathematics II;

(viii) Theory of Statistics II is taken only in conjunction with Mathematics III or Higher Mathematics III.

(c) Students who wish to be considered for admission to the Honours course in any School may be required to complete extra work concurrently with the Pass degree work.

3. (a) Before enrolling for the first year the student must have the approval of the Dean of the Faculty of Science for his first year studies.

(b) Before proceeding to the second year the student must have the approval of the Dean for the remainder of his course.

(c) Where any alteration in the approved course is necessitated by subsequent failure in a subject or for any other reason, the student must obtain approval for the alteration.
4. In general a full-time student should complete his course as follows:

1st Year.

(a) G10 English.
G20 History.
(b) Three subjects from Group I.

2nd Year.

(a) G30 Philosophy.
Social Elective Science.
(b) Three subjects from Group II,
or two subjects from Group II and one from Group I.

3rd 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 approved by Faculty.

5. Before enrolling for any of the subjects listed in the left-hand column below, the student shall have attended the classes and satisfied examiners in the subjects indicated as prerequisites.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry II</td>
<td>Chemistry I</td>
</tr>
<tr>
<td>Chemistry IIa</td>
<td>Chemistry I and General Biology.</td>
</tr>
<tr>
<td>Mathematics II</td>
<td>Mathematics I.</td>
</tr>
<tr>
<td>Higher Mathematics II</td>
<td>Mathematics I.</td>
</tr>
<tr>
<td>Physics II</td>
<td>Physics I and 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>Geography II</td>
<td>Geography I.</td>
</tr>
<tr>
<td>Geology II</td>
<td>Geology I.</td>
</tr>
<tr>
<td>Theory of Statistics I</td>
<td>Mathematics I.</td>
</tr>
</tbody>
</table>
### Subject.

#### Group III.
- Chemistry III.
- Mathematics III.
- Higher Mathematics III.
- Physics III.
- Botany II.
- Zoology II.
- Geography III.
- Geology III.
- Biochemistry I
- Biochemistry Ia.
- Theory of Statistics II.

#### Prerequisites.
- Chemistry II and Mathematics I.
- Mathematics II or Higher Mathematics II.
- Higher Mathematics II.
- Physics II and Mathematics II.
- Botany I and Chemistry III.
- Zoology I and Chemistry III.
- Geography II.
- Geology II.
- General Biology.
- Chemistry IIIa.
- Theory of Statistics I and Mathematics II or Higher Mathematics II.

6. Notwithstanding anything contained elsewhere in these regulations the following arrangement of subjects containing Psychology as a major shall constitute a course qualifying for admission to the degree of Bachelor of Science:

   (i) Humanities as specified under Section 1a but excluding Psychology from the elective subjects.
   (ii) Psychology I, Psychology II and Psychology III.
   (iii) Mathematics I and Mathematics II.
   (iv) General Biology.
   (v) Physics I.
   (vi) Botany I, or Zoology I, or Physics II.

### Honours.

7. (a) Suitability qualified candidates may be admitted to an Honours course requiring an extra year of full-time work in one of the following subjects:

   (i) Botany.
   (ii) Chemistry (Inorganic, Organic, Physical or Analytical).
   (iii) Geography.
   (iv) Geology.
   (v) Mathematics.
   (vi) Physics; Theoretical Physics.
   (vii) Zoology.
   (viii) Biochemistry.
   (ix) Theory of Statistics.
(b) Students desiring admission to the Honours course must apply to the Head of the appropriate School on completion of the Pass degree requirements.

(c) In order to qualify for Honours a candidate must complete the requirements for the degree within five calendar years of his initial enrolment.

(d) Students 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.

(e) Students proceeding to Honours in Physics will be required to have completed Mathematics III or Higher Mathematics III and Physics III and a course in Physical Techniques (approximately 7 hours per week concurrently with the pass degree work).

(f) Students who have completed Higher Mathematics III and Physics III may proceed to Honours in Theoretical Physics.

(g) Students proceeding to Honours in Geography must attend special seminars while taking Geography II and Geography III.

(h) Students proceeding to Honours in Mathematics must complete Higher Mathematics III.

(i) Students proceeding to Honours in Theory of Statistics must have completed Higher Mathematics III and additional work in connection with Theory of Statistics I and II.

COURSE IIb—SCIENCE.

8. For the benefit of part-time students the subjects of the course are provided in sections so that the requirements for the Pass degree may be satisfied by seven years of part-time study of approximately 12 hours per week.

The following table shows the time allocations (hours/week) for the various subjects:

(a) Humanities.—as listed under Section IA.

(b) Science Subjects—

<table>
<thead>
<tr>
<th>Group I</th>
<th>Hours per week for 34 weeks.</th>
<th></th>
<th>Hours per week for 34 weeks.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td></td>
</tr>
<tr>
<td>Chemistry I, Part I</td>
<td>2 — 2</td>
<td>Part II</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Physics I, Part I</td>
<td>1½ — 1½</td>
<td>Part II</td>
<td>1½ — 1½</td>
</tr>
<tr>
<td>Mathematics I, Part I</td>
<td>2 — 1</td>
<td>Part II</td>
<td>2 — 1</td>
</tr>
<tr>
<td>General Biology</td>
<td>2 — 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geography I</td>
<td>2 — 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geology I, Part I</td>
<td>2 — 1½</td>
<td>Part II</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>Course</td>
<td>Hours per week</td>
<td>Group II—</td>
<td>Group III—</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------</td>
<td>-------------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Chemistry II, Part I</td>
<td>2 — 2½</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Chemistry III, Part I</td>
<td>2 — 4</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Mathematics II, Part I</td>
<td>2 — 1</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Physics II, Part I</td>
<td>2 — 2</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Botany I, Part I</td>
<td>2 — 2</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Zoology I, Part I</td>
<td>2 — 2</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Geography II</td>
<td>2 — 3</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Geology II, Part I</td>
<td>2 — 3</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Theory of Statistics I, Part I</td>
<td>2 — 1</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Chemistry III, Part I</td>
<td>2 — 5</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Mathematics III, Part I</td>
<td>2 — 0</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Physics III, Part I</td>
<td>2 — 4</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Botany II, Part I</td>
<td>1 — 5</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Zoology II, Part I</td>
<td>1 — 5</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Geography III</td>
<td>2 — 3</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
<tr>
<td>Geology III, Part I</td>
<td>2 — 4</td>
<td>Part II ...</td>
<td>Part II ...</td>
</tr>
</tbody>
</table>

9. A part-time student must select his subjects in compliance with the regulations set out above for full-time students.
**SCHOOL OF CHEMICAL ENGINEERING.**

The courses in 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 work in chemistry, physics and mathematics is the same as that given in the Applied Chemistry and the Metallurgy courses in the first year of the full-time courses and in the first and second years of the part-time courses. 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 additional work for Honours may be taken in one full-time year, or in two part-time years as set out in Course IIIb1.

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.

**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</td>
<td>3 - 3</td>
</tr>
<tr>
<td>2.21 Chemical Techniques</td>
<td>0 - 3</td>
<td>0 - 0</td>
</tr>
<tr>
<td>2.41 General Chemistry</td>
<td>3 - 3</td>
<td>3 - 6</td>
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<tr>
<td>5.101 Engineering Drawing and Materials</td>
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<tr>
<td>5.211 Workshop Processes and Practice</td>
<td>0 - 0</td>
<td>0 - 0</td>
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<tr>
<td>10.11 Mathematics</td>
<td>4 - 2*</td>
<td>4 - 2*</td>
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<td>0 - 0</td>
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<td><strong>15 - 11</strong></td>
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* Tutorial.
### SECOND YEAR.
(34 weeks day course.)

<table>
<thead>
<tr>
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<tr>
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<td>lec. lab./tut.</td>
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<td>1½—0</td>
<td>1½—0</td>
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<td>1—3</td>
</tr>
<tr>
<td>2.42 Inorganic Chemistry</td>
<td>1—0</td>
<td>1—0</td>
<td>1—2½</td>
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<tr>
<td>2.52A Quantitative Analysis</td>
<td>1—3</td>
<td>1—2</td>
<td>1—0</td>
</tr>
<tr>
<td>2.62 Organic Chemistry</td>
<td>1—2½</td>
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<td>1—2</td>
<td>1—2</td>
<td>1—3</td>
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<td>8.132 Theory of Structures</td>
<td>1—1</td>
<td>1—1</td>
<td>1—1</td>
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<td>8.92M Properties of Materials</td>
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### THIRD YEAR.
(34 weeks day course.)

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<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<td>3.14 Industrial Chemistry†</td>
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<td>1½—2½</td>
<td>1½—2½</td>
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<td>3.24 Chemical Engineering Unit</td>
<td>3—3</td>
<td>3—3</td>
<td>3—3</td>
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<tr>
<td>Operations</td>
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<td>tions</td>
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† Includes Factory visits.
* Tutorial.

### FOURTH YEAR.
(34 weeks part-time course.)

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<th>Term 3</th>
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<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
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<td>4—3</td>
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</table>
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.)

<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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<td>Chemical Engineering Unit Operations</td>
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<td>Chemical Engineering Thermo-dynamics and Kinetics</td>
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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 additional work for Honours may be taken in one full-time year or two part-time years. During the second and third years, students attend the University part-time, while gaining practical experience in a related occupation in the food industry. For the first year, students follow the same course as full-time Chemical Engineering, and later specialize in methods of food preservation and related biological sciences.
**FIRST YEAR.**

(34 weeks full-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>1.11 Physics</td>
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<td>3 — 3</td>
<td>3 — 3</td>
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<td>2.21 Chemical Techniques</td>
<td>0 — 3</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>2.41 General Chemistry</td>
<td>3 — 3</td>
<td>3 — 6</td>
<td>3 — 9</td>
</tr>
<tr>
<td>2.101 Engineering Drawing and</td>
<td>2 — 0</td>
<td>1 — 3</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.211 Workshop Processes and Practice</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>0 — 3</td>
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<td>10.11 Mathematics</td>
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<tr>
<td>10.11B Mathematics</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>2 — 2*</td>
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<tr>
<td>G10 English</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>G20 History</td>
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<tr>
<td><strong>Total</strong></td>
<td>15 — 11</td>
<td>14 — 14</td>
<td>10 — 17</td>
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*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>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>2.52A Quantitative Analysis</td>
<td>1 — 3</td>
<td>1 — 2</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>10.22 Mathematics</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
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<tr>
<td>10.73 Statistics</td>
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<td>1 — 0</td>
<td>1 — 0</td>
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<td>17.30 Industrial Botany</td>
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<td>17.40 Industrial Entomology</td>
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<td>2 — 0</td>
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<td>G30 Philosophy</td>
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<td><strong>Total</strong></td>
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<td>9 — 6½</td>
<td>8 — 2½</td>
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**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>2.33 Physical Chemistry</td>
<td>1 — 2</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>2.63A Organic Chemistry</td>
<td>1 — 2½</td>
<td>1 — 2</td>
<td>1 — 2½</td>
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<tr>
<td>17.13 Biochemistry</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
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<tr>
<td>17.51 Microbiology</td>
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<td>Social Science Elective</td>
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<td>2 — 0</td>
<td>0 — 0</td>
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<td><strong>Total</strong></td>
<td>6 — 8½</td>
<td>6 — 8½</td>
<td>4 — 9</td>
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</table>
FOURTH YEAR.
(34 weeks full-time course.)

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>Applied Organic Chemistry</td>
<td>1 — 2</td>
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<td>Chemical Engineering Unit Operation</td>
<td>3 — 2½</td>
<td>3 — 2½</td>
<td>3 — 2½</td>
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<tr>
<td>Food Technology I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
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<tr>
<td>Food Technology II</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
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<tr>
<td>Theory of Machines</td>
<td>1 — 1*</td>
<td>1 — 1*</td>
<td>0 — 0</td>
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<td>Thermodynamics</td>
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<td>0 — 2</td>
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<tr>
<td>Microbiology</td>
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<td>2 — 0</td>
<td>0 — 0</td>
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</table>

* Tutorial.

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 third year is completed. The undermentioned additional courses must be taken. Portion of the additional work may be combined with the fourth year and the remainder completed in a fifth year.

Hours per week.

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
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<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td>Chemical Engineering Materials</td>
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<td>2</td>
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<tr>
<td>Advanced Food Technology</td>
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<td>8</td>
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<td>Food Technology Project</td>
<td>10</td>
<td>10</td>
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</table>

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.)

Hours per week.

<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>1½ — 1½</td>
<td>1½ — 1½</td>
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<td>Chemical Techniques</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
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<tr>
<td>General Chemistry, Part I</td>
<td>2 — 1*</td>
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* Tutorial.
SECOND YEAR.
(34 weeks part-time course.)

<table>
<thead>
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<th>Course Title</th>
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<td>2.41</td>
<td>General Chemistry, Part II</td>
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<td>5.101</td>
<td>Engineering Drawing and Materials</td>
<td>2</td>
<td>1</td>
<td>1</td>
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<td>5.211</td>
<td>Workshop Processes and Practice</td>
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<td>3</td>
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<td>10.11-b</td>
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* Tutorial.

THIRD YEAR.
(34 weeks part-time course.)

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<th>Term 3</th>
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<td>1½</td>
<td>1½</td>
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<td>2.42</td>
<td>Inorganic Chemistry</td>
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<td>2½</td>
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<td>2.62</td>
<td>Organic Chemistry</td>
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<td>0</td>
<td>1</td>
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<td>8.132</td>
<td>Theory of Structures</td>
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<td>1</td>
<td>1</td>
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<td>8.92M</td>
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FOURTH YEAR.
(34 weeks part-time course.)

<table>
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<th>Course Title</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<td>Physical Chemistry</td>
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<td>2</td>
<td>1</td>
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<td>2.52A</td>
<td>Quantitative Analysis</td>
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<td>3</td>
<td>1</td>
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<td>2.63</td>
<td>Organic Chemistry</td>
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<td>2½</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Hours per week.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1</td>
</tr>
<tr>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>5-7½</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>Term 1</td>
<td>1 1/2</td>
<td>2 1/2</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Term 2</td>
<td>2 0</td>
<td>2 0</td>
<td>2 0</td>
</tr>
<tr>
<td>Term 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **3.14 Industrial Chemistry**
- **3.44 Chemical Engineering Calculations**
- **5.33A Theory of Machines**
- **5.72D Thermodynamics**
- **6.94 Electrical Engineering**

† Includes Factory visits.
* Tutorial.

### 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>Term 1</td>
<td>3 1/2</td>
<td>2 1/2</td>
<td>3 1/2</td>
</tr>
<tr>
<td>Term 2</td>
<td>2 1/2</td>
<td>2 1/2</td>
<td>2 1/2</td>
</tr>
<tr>
<td>Term 3</td>
<td>2 0</td>
<td>2 0</td>
<td>2 0</td>
</tr>
</tbody>
</table>

- **3.24D Chemical Engineering Unit Operations**
- **3.34D Chemical Engineering Design**
- **3.54 Chemical Engineering Materials**

### Seventh 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>Term 1</td>
<td>2 0</td>
<td>2 0</td>
<td>2 0</td>
</tr>
<tr>
<td>Term 2</td>
<td>1 0</td>
<td>1 0</td>
<td>1 0</td>
</tr>
<tr>
<td>Term 3</td>
<td>2 0</td>
<td>2 0</td>
<td>2 0</td>
</tr>
</tbody>
</table>

- **G13 English or G23 History**
- **G30.1 Logic**
- **G43 Economics or G63 Psychology**
- **G50.1 Government**

### 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.
COURSE IIIb2—INDUSTRIAL CHEMISTRY.

This course provides part-time instruction for students in appropriate employment in the chemical industry. Students are given a sound general background of fundamental sciences, with particular emphasis on analytical chemistry, and are then trained in the broad aspects of plant and process development. The course may be taken at Pass or Honours standard. Students taking a Pass degree may complete the course in six years, while those attempting Honours take additional work in the sixth year and are required to complete a seventh year.

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. 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>
</tr>
<tr>
<td>2.21 Chemical Techniques</td>
<td>2—4</td>
<td>2—4</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
<td>2—1*</td>
<td>2—1*</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part I</td>
<td>5½—6½</td>
<td>5½—6½</td>
</tr>
</tbody>
</table>

* Tutorial.

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. 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>
</tr>
<tr>
<td>2.41 General Chemistry, Part II</td>
<td>1—2½</td>
<td>1—2½</td>
</tr>
<tr>
<td>5.101 Engineering Drawing and Materials</td>
<td>2—0</td>
<td>1—3</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part II</td>
<td>6½—5</td>
<td>4½—8</td>
</tr>
</tbody>
</table>

* Tutorial.
### THIRD YEAR.
(34 weeks part-time course.)

<table>
<thead>
<tr>
<th>Term</th>
<th>lec.</th>
<th>lab./tut.</th>
<th>lec.</th>
<th>lab./tut.</th>
<th>lec.</th>
<th>lab./tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.92</td>
<td>Physics *</td>
<td>1(\frac{1}{4})</td>
<td>0</td>
<td>1(\frac{1}{4})</td>
<td>2</td>
<td>1(\frac{1}{4})</td>
</tr>
<tr>
<td>2.32</td>
<td>Physical Chemistry</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>2.42</td>
<td>Inorganic Chemistry</td>
<td>1</td>
<td>2(\frac{1}{2})</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2.52</td>
<td>Quantitative Analysis</td>
<td>1</td>
<td>2(\frac{1}{2})</td>
<td>1</td>
<td>2(\frac{1}{2})</td>
<td>1</td>
</tr>
<tr>
<td>2.62</td>
<td>Organic Chemistry</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2(\frac{1}{2})</td>
<td>1</td>
</tr>
<tr>
<td>2.72</td>
<td>Mathematical Chemistry</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

* Alternative subject—

| 2.23 | Chemical Instrumentation | 1 | 1\(\frac{1}{4}\) | 1 | 1\(\frac{1}{4}\) | 1 | 1\(\frac{1}{4}\) |

### FOURTH YEAR.
(34 weeks part-time course.)

<table>
<thead>
<tr>
<th>Term</th>
<th>lec.</th>
<th>lab./tut.</th>
<th>lec.</th>
<th>lab./tut.</th>
<th>lec.</th>
<th>lab./tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.33</td>
<td>Physical Chemistry</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2(\frac{1}{2})</td>
<td>1</td>
</tr>
<tr>
<td>2.53</td>
<td>Quantitative Analysis</td>
<td>1</td>
<td>2(\frac{1}{2})</td>
<td>1</td>
<td>2(\frac{1}{2})</td>
<td>1</td>
</tr>
<tr>
<td>2.73</td>
<td>Mathematical Chemistry</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3.14</td>
<td>Industrial Chemistry</td>
<td>1(\frac{1}{4})</td>
<td>2(\frac{1}{2})</td>
<td>1(\frac{1}{4})</td>
<td>2(\frac{1}{2})</td>
<td>1(\frac{1}{4})</td>
</tr>
</tbody>
</table>

| 4\(\frac{1}{4}\) | 7 | 4\(\frac{1}{4}\) | 7\(\frac{1}{2}\) | 4\(\frac{1}{4}\) | 7 |

### FIFTH YEAR.
(34 weeks part-time course.)

<table>
<thead>
<tr>
<th>Term</th>
<th>lec.</th>
<th>lab./tut.</th>
<th>lec.</th>
<th>lab./tut.</th>
<th>lec.</th>
<th>lab./tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.34p</td>
<td>Physical Chemistry</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>3.15</td>
<td>Industrial Chemistry</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>3.44</td>
<td>Chemical Engineering Calculations</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>3.54</td>
<td>Chemical Engineering Materials</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

| 6 | 6 | 6 | 6 | 6 | 6 |
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>G13 English or G23 History</td>
<td></td>
<td></td>
<td></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</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 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>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<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>
</tr>
<tr>
<td>Industrial Chemistry Project</td>
<td>0 — 12</td>
<td>0 — 12</td>
<td>0 — 12</td>
</tr>
</tbody>
</table>

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 Engineers for the first three years and thereafter specialise 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>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11 Physics, Part I</td>
</tr>
<tr>
<td>2.21 Chemical Techniques</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part I</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1</td>
</tr>
<tr>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1 1/2</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>5 1/2</td>
</tr>
</tbody>
</table>

* Tutorial.

# Second Year

*(34 weeks part-time course.)*

<table>
<thead>
<tr>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11 Physics, Part II</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part II</td>
</tr>
<tr>
<td>5.101 Engineering Drawing and Materials</td>
</tr>
<tr>
<td>5.211 Workshop Processes and Practice</td>
</tr>
<tr>
<td>10.11-b Mathematics, Part II</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1</td>
</tr>
<tr>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1 1/2</td>
</tr>
<tr>
<td>1 2</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>6 1/2</td>
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</tbody>
</table>

* Tutorial.

# Third Year

*(34 weeks part-time course.)*

<table>
<thead>
<tr>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.32 Physical Chemistry</td>
</tr>
<tr>
<td>2.42 Inorganic Chemistry</td>
</tr>
<tr>
<td>2.52a Quantitative Analysis</td>
</tr>
<tr>
<td>2.62 Organic Chemistry</td>
</tr>
<tr>
<td>10.22 Mathematics</td>
</tr>
<tr>
<td>10.73 Statistics</td>
</tr>
<tr>
<td>17.30 Industrial Botany</td>
</tr>
<tr>
<td>17.40 Industrial Entomology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1</td>
</tr>
<tr>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1</td>
</tr>
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<tr>
<td>1</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>7</td>
</tr>
</tbody>
</table>
FOURTH YEAR.
(34 weeks part-time course.)

<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>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Microbiology</td>
<td>4 - 8</td>
<td>4 - 8</td>
<td>4 - 9</td>
</tr>
</tbody>
</table>

FIFTH YEAR.
(34 weeks part-time course.)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Organic Chemistry</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Food Technology I</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Theory of Machines</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>
</tr>
<tr>
<td>Microbiology</td>
<td>5 - 8</td>
<td>5 - 8</td>
<td>3 - 8</td>
</tr>
</tbody>
</table>

* Tutorial.

SIXTH YEAR.
(34 weeks part-time course.)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering Unit Operations</td>
<td>3 - 2</td>
<td>3 - 2</td>
<td>3 - 2</td>
</tr>
<tr>
<td>Food Technology II</td>
<td>2 - 4</td>
<td>2 - 4</td>
<td>2 - 4</td>
</tr>
<tr>
<td></td>
<td>5 - 6</td>
<td>5 - 6</td>
<td>5 - 6</td>
</tr>
</tbody>
</table>

SEVENTH YEAR.
(34 weeks part-time course.)

<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>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Logic</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Economics or G63 Psychology</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Government</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
</tbody>
</table>

G13 English or G23 History
G30.1 Logic
G43 Economics or G63 Psychology
G50.1 Government
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>Chemical Engineering Materials</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Advanced Food Technology</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Food Technology Project</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

CONVERSION COURSE IIIo—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>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics Part II</td>
<td>2</td>
</tr>
<tr>
<td>Physics Part II</td>
<td>3</td>
</tr>
<tr>
<td>Conversion Humanities—</td>
<td></td>
</tr>
<tr>
<td>English or History or Philosophy</td>
<td>2</td>
</tr>
<tr>
<td>Psychology or Economics or Government</td>
<td>2</td>
</tr>
</tbody>
</table>

Plus advanced laboratory work on a specified project and the presentation of a thesis, together with such special subjects as are prescribed in each case.

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.
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 (Pass or 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.

The first year of the full-time course and the first and second years of the part-time course are identical with those of the Applied Chemistry and Chemical Engineering courses.

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.

The degree of Bachelor of Science (Pass or Honours), is awarded depending on the degree of success of the student during the course. 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-months period between the third and fourth years in which a student must obtain industrial experience. Lectures and laboratory work during this period cease completely so that students may travel to other centres for their industrial training.

 Provision is made in the course for a limited amount of specialisation of the student's own choice in the final year.
### 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>1.11 Physics</td>
<td>3 - 3</td>
<td>3 - 3</td>
<td>3 - 3</td>
</tr>
<tr>
<td>2.21 Chemical Techniques</td>
<td>0 - 0</td>
<td>0 - 0</td>
<td>0 - 0</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 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>4 - 2</td>
<td>4 - 2</td>
<td>0 - 0</td>
</tr>
<tr>
<td>10.11 Mathematics</td>
<td>0 - 0</td>
<td>0 - 0</td>
<td>2 - 2</td>
</tr>
<tr>
<td>10.11B Mathematics</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>G10 English</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>2 - 0</td>
</tr>
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</table>

**Total:** 15 - 11 14 - 14 10 - 17

### 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>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 - 0</td>
</tr>
<tr>
<td>2.42d 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>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>4.22 Metallurgical Engineering I</td>
<td>1 - 2½</td>
<td>3 - 3½</td>
<td>2 - 2½</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 - 1½</td>
</tr>
<tr>
<td>8.92c Properties of Materials‡</td>
<td>0 - 0</td>
<td>1 - 1½</td>
<td>1 - 1½</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>0 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
</tbody>
</table>

**Total:** 9½ - 10 15½ - 14 14½ - 14

* Tutorial.
† Includes one hour report writing.
‡ These courses begin in the sixth week of first term.

### 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. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<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>A and B</td>
<td>2 - 3½</td>
<td>2 - 3½</td>
<td>2 - 3½</td>
</tr>
<tr>
<td>4.33 Physical Metallurgy II</td>
<td>0 - 1½</td>
<td>0 - 1½</td>
<td>0 - 1½</td>
</tr>
<tr>
<td>4.54 Metallurgy Seminar, Part I</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>6.94 Electrical Engineering</td>
<td>2 - 3</td>
<td>2 - 3</td>
<td>2 - 3</td>
</tr>
<tr>
<td>7.034 Mineral Dressing</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>13 - 14½</td>
<td>13 - 14½</td>
<td>9 - 13½</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</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<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>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 months' 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 (Pass degree), 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></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>2.21 Chemical Techniques</td>
<td>0 — 3</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
<td>3 — 0</td>
<td>2 — 4</td>
<td>1 — 5</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>6½— 5½</td>
<td>5½— 6½</td>
<td>4½— 7½</td>
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</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>1.11 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</td>
<td>2½</td>
<td>1</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>2 1*</td>
<td>1 1*</td>
<td>1 1*</td>
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<tr>
<td>10.11-b Mathematics, Part II</td>
<td>6½ 5</td>
<td>4½ 8</td>
<td>3½ 9½</td>
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</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>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 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>
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<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>1 0</td>
<td>1 0</td>
<td>1 0</td>
</tr>
<tr>
<td>8.920 Properties of Materials (equivalent time)</td>
<td>0 0</td>
<td>1 1½</td>
<td>1 1½</td>
</tr>
<tr>
<td></td>
<td>5½ 5</td>
<td>6½ 5½</td>
<td>6½ 5½</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>
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<td>1 1</td>
<td>1 1</td>
<td>1 1</td>
</tr>
<tr>
<td>2.42d Inorganic Chemistry</td>
<td>1 0</td>
<td>1 0</td>
<td>1 0</td>
</tr>
<tr>
<td>2.73 Mathematical Chemistry</td>
<td>1 0</td>
<td>1 0</td>
<td>1 0</td>
</tr>
<tr>
<td>4.32 Physical Metallurgy I</td>
<td>1 3</td>
<td>2 3</td>
<td>2 3</td>
</tr>
<tr>
<td>7.612d Mineralogy</td>
<td>1 1½</td>
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<td>1 0</td>
</tr>
<tr>
<td></td>
<td>5 5½</td>
<td>6 5½</td>
<td>6 4</td>
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</table>
### FIFTH 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>Metallurgical Engineering I</td>
<td>2 — 3†⁻¹*</td>
<td>2 — 2⁻¹*</td>
<td>2 — 2⁻¹*</td>
</tr>
<tr>
<td>Physical Metallurgy II</td>
<td>2 — 3½</td>
<td>2 — 3½</td>
<td>2 — 3½</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4 — 7½</td>
<td>4 — 6½</td>
<td>4 — 6½</td>
</tr>
</tbody>
</table>

* Tutorial. † Includes one hour report writing.

### SIXTH 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>co. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>Metallurgical Engineering II and Project</td>
<td>2 — 3</td>
<td>2 — 3</td>
<td>2 — 5</td>
</tr>
<tr>
<td>Industrial Metallurgy*</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Metallurgy Seminar†</td>
<td>1 — 0</td>
<td>0 — 2</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Metallurgical Engineering IIb...</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical Engineering I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7-6-4-6</td>
<td>6-5-6-8</td>
<td>5-4-5-7</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></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>
</tr>
<tr>
<td>English or G23 History</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Logic</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Economics or G63 Psychology</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><strong>Total</strong></td>
<td>6 — 0</td>
<td>6 — 0</td>
<td>6 — 0</td>
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</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 current Secondary Metallurgy diploma course (Sydney).

<table>
<thead>
<tr>
<th>Hours per week.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.92 Physics ........................................</td>
</tr>
<tr>
<td>2.72 Mathematical Chemistry ................................</td>
</tr>
<tr>
<td>2.73 Mathematical Chemistry ................................</td>
</tr>
<tr>
<td>4.54 Metallurgy Seminar ................................</td>
</tr>
<tr>
<td>Conversion Humanities—</td>
</tr>
<tr>
<td>English or History or Philosophy ..................</td>
</tr>
<tr>
<td>and Psychology or Economics or Government ....</td>
</tr>
<tr>
<td>Together with any special subjects prescribed.</td>
</tr>
</tbody>
</table>

CONVERSION COURSE IVc2—METALLURGY.
Conversion course to Bachelor of Science from current Metallurgy diploma course (Newcastle and Wollongong).

<table>
<thead>
<tr>
<th>Hours per week.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.42d Physics ........................................</td>
</tr>
<tr>
<td>2.72 Mathematical Chemistry ................................</td>
</tr>
<tr>
<td>2.73 Mathematical Chemistry ................................</td>
</tr>
<tr>
<td>4.54 Metallurgy Seminar ................................</td>
</tr>
<tr>
<td>Conversion Humanities—</td>
</tr>
<tr>
<td>English or History or Philosophy ..................</td>
</tr>
<tr>
<td>and Psychology or Economics or Government ....</td>
</tr>
<tr>
<td>Together with any special subjects prescribed.</td>
</tr>
</tbody>
</table>
SCHOOL OF MECHANICAL ENGINEERING.

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.

Three courses are provided leading to the degree of Bachelor of Engineering (Pass or Honours): Course V, a four years day course; Course VB, a part-time course extending over seven years; and Conversion Course Vc, to enable Associates of Sydney Technical College in Mechanical Engineering to qualify for the degree.

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 who 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>lec. lab./tut.</td>
<td>3 - 3</td>
<td>3 - 3</td>
</tr>
<tr>
<td>1.41 Physics</td>
<td>3 - 3</td>
<td>3 - 0</td>
</tr>
<tr>
<td>2.111 Chemistry</td>
<td>0 - 3*</td>
<td>0 - 3*</td>
</tr>
<tr>
<td>5.11 Engineering Drawing</td>
<td>2½ - 0</td>
<td>2½ - 0</td>
</tr>
<tr>
<td>5.21 Mechanical Technology</td>
<td>1 - 2½*</td>
<td>1 - 2½*</td>
</tr>
<tr>
<td>5.41 Descriptive Geometry</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
</tr>
<tr>
<td>8.11 Engineering Mechanics</td>
<td>4 - 2*</td>
<td>4 - 2*</td>
</tr>
<tr>
<td>10.11 Mathematics</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>G10 English</td>
<td>16½-14½</td>
<td>16½-11½</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>lec. lab./tut.</td>
<td>2 - 2½</td>
<td>2 - 2½</td>
</tr>
<tr>
<td>1.42 Physics</td>
<td>1½ - 2</td>
<td>1½ - 2</td>
</tr>
<tr>
<td>4.912 Materials Technology</td>
<td>3 - 0</td>
<td>3 - 0</td>
</tr>
<tr>
<td>5.22 Mechanical Technology</td>
<td>1½ - 1*</td>
<td>1½ - 1*</td>
</tr>
<tr>
<td>5.32 Engineering Mechanics</td>
<td>1½ - 1*</td>
<td>1½ - 1*</td>
</tr>
<tr>
<td>5.52 Fluid Mechanics</td>
<td>1 - 1½*</td>
<td>1 - 1½*</td>
</tr>
<tr>
<td>5.72 Thermodynamics</td>
<td>0 - 0</td>
<td>1 - 2</td>
</tr>
<tr>
<td>8.112 Theory of Structures</td>
<td>3 - 2*</td>
<td>3 - 2*</td>
</tr>
<tr>
<td>8.92 Properties of Materials</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>G20 History</td>
<td>16½-11½</td>
<td>17½-13½</td>
</tr>
</tbody>
</table>

* Tutorial.
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>Mechanical Engineering Design</td>
<td>0 — 3*</td>
<td>0 — 3*</td>
</tr>
<tr>
<td>Mechanical Technology</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Theory of Machines</td>
<td>1½ — 1*</td>
<td>1½ — 1*</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td>1 — 1½-1*</td>
<td>1 — 1½-1*</td>
</tr>
<tr>
<td>Thermodynamics</td>
<td>1 — 1½-1*</td>
<td>1 — 1½-1*</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>1 — 3-1*</td>
<td>1 — 3-1*</td>
</tr>
<tr>
<td>Structures (Theory and Design)</td>
<td>2 — 3*</td>
<td>2 — 3*</td>
</tr>
<tr>
<td>Engineering Computations</td>
<td>1½ — 0</td>
<td>1½ — 0</td>
</tr>
<tr>
<td>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>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>14 — 15</td>
<td>14 — 15</td>
</tr>
</tbody>
</table>

* 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</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Engineering Design</td>
<td>0 — 4½*</td>
<td>0 — 4½*</td>
<td></td>
</tr>
<tr>
<td>Mechanical Engineering Design</td>
<td>0 — 3*</td>
<td>0 — 6*</td>
<td></td>
</tr>
<tr>
<td>Theory of Machines</td>
<td>1 — 2*</td>
<td>1 — 2*</td>
<td></td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td>1 — 1½-1½*</td>
<td>1 — 1½-1½*</td>
<td></td>
</tr>
<tr>
<td>Thermodynamics</td>
<td>1½ — 1½-1½*</td>
<td>1½ — 1½-1½*</td>
<td></td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>1 — 2½-1½*</td>
<td>0 — 0</td>
<td></td>
</tr>
<tr>
<td>Professional Elective I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td></td>
</tr>
<tr>
<td>Professional Elective II</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Thesis Work</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>0 — 26</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8½-22</td>
<td>7½-22</td>
<td>2-26</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.
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>1 ½</td>
<td>1 ½</td>
<td>1 ½</td>
</tr>
<tr>
<td>Chemistry</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Engineering Drawing</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Descriptive Geometry</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Engineering Mechanics</td>
<td>1 ½</td>
<td>1 ½</td>
<td>1 ½</td>
</tr>
<tr>
<td>Mathematics, Part I</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

* 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>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Technology</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mechanical Technology</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mechanical Technology</td>
<td>1 ½</td>
<td>0</td>
<td>1 ½</td>
</tr>
<tr>
<td>Theory of Structures</td>
<td>1 ½</td>
<td>1 ½</td>
<td>0</td>
</tr>
<tr>
<td>Surveying†</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Properties of Materials</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mathematics, Part II</td>
<td>1 ½</td>
<td>1 ½</td>
<td>1 ½</td>
</tr>
<tr>
<td>English</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

* Tutorial.

† Plus four six-hour periods on Saturdays for fieldwork.
### 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>5.13D</td>
<td>Mechanical Engineering Design</td>
<td>0 — 3*</td>
<td>0 — 3*</td>
<td>0 — 3*</td>
</tr>
<tr>
<td>5.23D</td>
<td>Mechanical Technology</td>
<td>1 1/2 — 0</td>
<td>1 — 1/2*</td>
<td>1 — 1/2*</td>
</tr>
<tr>
<td>5.32D</td>
<td>Engineering Mechanics</td>
<td>1 1/2 — 1*</td>
<td>1 — 1/2*</td>
<td>1 — 1/2*</td>
</tr>
<tr>
<td>5.72D</td>
<td>Thermodynamics</td>
<td>1 — 1/2*</td>
<td>1 — 1/2*</td>
<td>0 — 2</td>
</tr>
<tr>
<td>6.83D</td>
<td>Electrical Engineering</td>
<td>1 — 1/2*</td>
<td>1 — 1/2*</td>
<td>1 — 1/2</td>
</tr>
<tr>
<td>10.12</td>
<td>Mathematics, Part I</td>
<td>1 — 1/2*</td>
<td>1 — 1/2*</td>
<td>1 — 1/2*</td>
</tr>
</tbody>
</table>

* Tutorial.

### 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>5.33D</td>
<td>Theory of Machines</td>
<td>1 — 1*</td>
<td>1 — 1*</td>
<td>1 — 1*</td>
</tr>
<tr>
<td>5.52D</td>
<td>Fluid Mechanics</td>
<td>1 — 1/2*</td>
<td>1 — 1/2*</td>
<td>0 — 0</td>
</tr>
<tr>
<td>5.73D</td>
<td>Thermodynamics</td>
<td>1 — 1</td>
<td>1 — 1*</td>
<td>0 — 2</td>
</tr>
<tr>
<td>6.84D</td>
<td>Electrical Engineering</td>
<td>1 1/2 — 1/2*</td>
<td>1 1/2 — 1/2*</td>
<td>1 — 1/2</td>
</tr>
<tr>
<td>8.123d</td>
<td>Structures (Theory and Design)</td>
<td>1 1/2 — 1/2*</td>
<td>1 1/2 — 1/2*</td>
<td>1 1/2</td>
</tr>
<tr>
<td>G20</td>
<td>History</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

* Tutorial.

### Fifth 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>5.14D</td>
<td>Mechanical Engineering Design</td>
<td>0 — 3</td>
<td>0 — 3</td>
<td>0 — 3</td>
</tr>
<tr>
<td>5.53D</td>
<td>Fluid Mechanics</td>
<td>1 — 1/2*</td>
<td>1 — 1/2*</td>
<td>1 — 1/2*</td>
</tr>
<tr>
<td>5.74D</td>
<td>Thermodynamics</td>
<td>1 1/2 — 1/2*</td>
<td>1 1/2 — 1/2*</td>
<td>1 — 1/2*</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>1 1/2 — 0</td>
<td>1 1/2</td>
<td>0 — 0</td>
</tr>
</tbody>
</table>

* 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>
</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</td>
<td>1½</td>
<td>1½</td>
</tr>
<tr>
<td>5.34d Theory of Machines</td>
<td>1</td>
<td>½*</td>
<td>1</td>
</tr>
<tr>
<td>8.33 Engineering Computations</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>10.12 Mathematics, Part II</td>
<td>1</td>
<td>½*</td>
<td>1</td>
</tr>
<tr>
<td>6.30 Philosophy</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>6½</td>
<td>2½</td>
<td>6½</td>
</tr>
</tbody>
</table>

* Tutorial.

### 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></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>5.54d Fluid Mechanics</td>
<td>1</td>
<td>2*</td>
<td>1</td>
</tr>
<tr>
<td>† Professional Elective I</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>† Professional Elective II</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Thesis Work</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>5—6</td>
<td>4—6</td>
<td>2—3½</td>
</tr>
</tbody>
</table>

* Tutorial.

† As set out for the fourth year of Course V—Mechanical Engineering.

### Conversion Course Vo—Mechanical Engineering

Holders of a diploma in Mechanical 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 Bachelor of Engineering degree.

1. Satisfactorily complete the following subjects in the evening as one year courses over three terms.

<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>10.12d Mathematics Parts I and II</td>
<td>2—1*</td>
<td>2—1*</td>
<td>2—1*</td>
</tr>
<tr>
<td>1.42d Physics</td>
<td>1½—1½</td>
<td>2½—1½</td>
<td>2½—1½</td>
</tr>
<tr>
<td>† Conversion Humanities—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English or History or Philosophy</td>
<td>2—0</td>
<td>2—0</td>
<td>2—0</td>
</tr>
<tr>
<td>and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychology or Economics</td>
<td>2—0</td>
<td>2—0</td>
<td>2—0</td>
</tr>
<tr>
<td>or Government</td>
<td>2—0</td>
<td>2—0</td>
<td>2—0</td>
</tr>
<tr>
<td></td>
<td>5½—7½—2½</td>
<td>6½—8½—2½</td>
<td>6½—8½—2½</td>
</tr>
</tbody>
</table>

† One of the two Humanities subjects required may, if desired, be taken in the next year of the Conversion programme as set out in 2 below.

* Tutorial.
2. On completion of the work prescribed under 1 above, the student may—

(a) enrol for the fourth year of the normal degree course less the Humanities subjects already completed and with the substitution of 8.33 Engineering Computations for 5.14 Mechanical Engineering Design; or

(b) enrol for the following programme of part-time study over two years.

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>5.54D Fluid Mechanics</td>
<td>1 — 2*</td>
<td>1 — 2</td>
<td>1 — ½*</td>
</tr>
<tr>
<td>8.43D Surveying</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.33D Engineering Computations</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Professional Elective I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Conversion Humanities</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

+ Plus seven six hour periods for Survey Fieldwork.

Students who have completed Engineering Surveying I may be exempted from 8.43D.
Students who have completed 8.42A Surveying or Surveying IB may attend the one week survey Camp held in third term in lieu of 8.43D.

† This subject need only be taken if it is necessary for the student to complete the Humanities requirements set out in (1) above.

* Tutorial.

SECOND 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>Professional Elective II</td>
<td>1 — 2*</td>
<td>1 — 2*</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Professional Elective III</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Seminars</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>Thesis Work</td>
<td>0 — 3</td>
<td>0 — 3</td>
<td>0 — 6</td>
</tr>
</tbody>
</table>

* Tutorial.

NOTE: (i) A thesis will be required of conversion students. In determining its nature and content the student's diploma thesis will be taken into consideration.

(ii) The choice of Professional Elective subjects is set out on page 158 of the Calendar.
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.

Five courses are provided leading to the degree of Bachelor of Engineering (Pass or Honours), 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>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</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>2½ — 0</td>
<td>2½ — 0</td>
</tr>
<tr>
<td>5.41 Descriptive Geometry</td>
<td>1 — 2½*</td>
<td>1 — 2½*</td>
</tr>
<tr>
<td>8.111 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>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.12 Physics</td>
<td>4 — 3</td>
<td>4 — 3</td>
</tr>
<tr>
<td>4.912 Materials Technology</td>
<td>1½ — 2</td>
<td>1½ — 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 — 2</td>
</tr>
<tr>
<td>8.112 Theory of Structures</td>
<td>1½ — 1*</td>
<td>1½ — 1*</td>
</tr>
<tr>
<td>8.92m Properties of Materials</td>
<td>½ — 1</td>
<td>½ — 1</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.
### 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>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 - 0</td>
</tr>
<tr>
<td>6.23 Electric Power Engineering</td>
<td>3 - 3</td>
<td>3 - 6</td>
</tr>
<tr>
<td>6.303 Electronics</td>
<td>3 - 3</td>
<td>3 - 3</td>
</tr>
<tr>
<td>8.41 Surveying †</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>10.33 Mathematics</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td><strong>10.63 Statistics</strong></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>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td></td>
<td><strong>18 - 11</strong></td>
<td><strong>18 - 11</strong></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></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<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>
<tr>
<td></td>
<td><strong>15 - 11</strong></td>
<td><strong>15 - 11</strong></td>
</tr>
</tbody>
</table>

PLUS one of the following three options:

**Option 1—Power Apparatus and Systems.**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.214 Power Systems</td>
<td>4 - 3</td>
<td>4 - 3</td>
</tr>
<tr>
<td>6.224 Electrical Machines</td>
<td>4 - 3</td>
<td>4 - 3</td>
</tr>
</tbody>
</table>

**Option 2—Utilization and Control.**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.234 Utilization and Control of Electrical Plant</td>
<td>4 - 3</td>
<td>4 - 3</td>
</tr>
<tr>
<td>6.344 Applied Electronics</td>
<td>4 - 3</td>
<td>4 - 3</td>
</tr>
</tbody>
</table>

**Option 3—Communications.**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.314 Radio Communication</td>
<td>8 - 6</td>
<td>8 - 6</td>
</tr>
<tr>
<td>6.334 Line Communication</td>
<td>8 - 6</td>
<td>8 - 6</td>
</tr>
<tr>
<td></td>
<td><strong>15 - 11</strong></td>
<td><strong>15 - 11</strong></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 5.33 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.

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>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>1½—1½</td>
<td>1½—1½</td>
<td>1½—1½</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 41d</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 111</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>2 — 1</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.111</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 11d Engineering 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>10.11 Mathematics, Part I</td>
<td>1½—1½*</td>
<td>1½—1½*</td>
<td>1½—1½*</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>1½—1½</td>
<td>2½—1½</td>
<td>2½—1½</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
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</tr>
<tr>
<td>1 42d</td>
<td></td>
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<td></td>
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<tr>
<td>6 12d Electric Circuit Theory</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>8 132 Theory of Structures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 92m Properties of Materials</td>
<td>1 — 1</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>10.11 Mathematics, Part II</td>
<td>1½—1½*</td>
<td>1½—1½*</td>
<td>1½—1½*</td>
</tr>
<tr>
<td>G10 English</td>
<td>2 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
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</tbody>
</table>

7 — 5 7 — 5 7 — 5
### 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>1 ½ - 0</td>
<td>1 ½ - 0</td>
<td>0 - 1 ½</td>
</tr>
<tr>
<td>Electric Circuit Theory</td>
<td>1 - 1 ½</td>
<td>1 - 1 ½</td>
<td>1 - 1 ½</td>
</tr>
<tr>
<td>Electric Power Engineering</td>
<td>1 - 1 ½</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Electronics</td>
<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
</tr>
<tr>
<td>Mathematics Part I</td>
<td>1 - 1 ½</td>
<td>1 - 1 ½</td>
<td>1 - 1 ½</td>
</tr>
<tr>
<td>Mathematics, Part II</td>
<td>1 - 1 ½</td>
<td>1 - 1 ½</td>
<td>1 - 1 ½</td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
<td>1 ½ - 1 ½</td>
</tr>
<tr>
<td></td>
<td>7 - 5</td>
<td>7 - 5</td>
<td>5 ½ - 6 ½</td>
</tr>
</tbody>
</table>

*Tutorial.

### 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>Electric Circuit Theory</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
</tr>
<tr>
<td>Electric Power Engineering</td>
<td>1 - 1 ½-1 ½</td>
<td>1 - 1 ½-1 ½</td>
<td>1 - 1 ½-1 ½</td>
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<tr>
<td>Electronics</td>
<td>1 - 1 ½-1 ½</td>
<td>1 - 1 ½-1 ½</td>
<td>1 - 1 ½-1 ½</td>
</tr>
<tr>
<td>Mathematics</td>
<td>1 - 1</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>History</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td></td>
<td>5 - 6</td>
<td>5 - 6</td>
<td>6 - 6</td>
</tr>
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</table>

*Tutorial.

### 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>Materials Technology</td>
<td>1 - 1 ½</td>
<td>1 - 1 ½</td>
<td>1 - 1 ½</td>
</tr>
<tr>
<td>Theory of Machines</td>
<td>1 - 1</td>
<td>1 - 1</td>
<td>0 - 0</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>4 - 3</td>
<td>4 - 3</td>
<td>4 - 3</td>
</tr>
<tr>
<td>Surveying†</td>
<td>0 - 0</td>
<td>0 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td></td>
<td>6 - 5 ½</td>
<td>6 - 5 ½</td>
<td>6 - 4 ½</td>
</tr>
</tbody>
</table>

† Plus four six-hour periods on Saturdays for fieldwork.
**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>2 - 0</td>
<td>1 - 0</td>
<td>1 - 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></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>4 - 8</td>
<td>3 - 8</td>
<td>3 - 8</td>
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</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>Electrical Engineering—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 1—Power Systems</td>
<td>2 - 4</td>
<td>2 - 4</td>
<td>2 - 4</td>
</tr>
<tr>
<td>Option 2—Applied Electronics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 3—Communications II</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td>1 - 0</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>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 - 8</td>
<td>3 - 8</td>
<td>3 - 8</td>
</tr>
</tbody>
</table>

**CONVERSION COURSES—ELECTRICAL ENGINEERING.**

COURSE VIc1—(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.
COURSE VIc2—(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.

This work would normally be completed in three years, but could be spread over a longer period.

1.43D Physics .................................................. 1½
5.53D Theory of Machines .................................... 2
5.62 Fluid Mechanics ........................................... 2 (2 terms).
6.304A Industrial Electronics and Control ................. 3
6.304B Industrial Electronics and Control ................... 2
8.42A Surveying ................................................. 1 (1 term).
10.33 Mathematics ............................................... 2
Professional Elective .......................................... 2
Thesis ............................................................ 4
Conversion Humanities—
  English or History or Philosophy ......................... 2
  Psychology or Economics or Government ................. 2

* To be taken by diplomates of later than 1951 as a prerequisite 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.

Hours per week for 34 weeks.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.43D</td>
<td>Physics</td>
<td>1 1/2</td>
</tr>
<tr>
<td>4.912</td>
<td>Materials Technology</td>
<td>2 1/2</td>
</tr>
<tr>
<td>5.33D</td>
<td>Theory of Machines</td>
<td>2</td>
</tr>
<tr>
<td>5.52</td>
<td>Fluid Mechanics</td>
<td>2 (2 terms).</td>
</tr>
<tr>
<td>5.72</td>
<td>Thermodynamics</td>
<td>2</td>
</tr>
<tr>
<td>6.23B</td>
<td>Electric Power Engineering</td>
<td>3</td>
</tr>
<tr>
<td>6.304A</td>
<td>Industrial Electronics and Control</td>
<td>3</td>
</tr>
<tr>
<td>6.304B</td>
<td>Industrial Electronics and Control</td>
<td>2</td>
</tr>
<tr>
<td>8.42A</td>
<td>Surveying</td>
<td>1 (1 term).</td>
</tr>
<tr>
<td>10.33</td>
<td>Mathematics</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Professional Elective</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Thesis</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Conversion Humanities—</td>
<td></td>
</tr>
<tr>
<td></td>
<td>English or History or Philosophy</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Psychology or Economics or Government</td>
<td>2</td>
</tr>
</tbody>
</table>

This work would normally be completed in three years, but could be spread over a longer period.

GRADUATE COURSE IN AUTOMATIC CONTROL.

A graduate course in Automatic Control consisting of two part-time years of advanced evening study was introduced in 1956. The course is designed to assist those who intend to specialise in feedback control systems and who wish to obtain the degree of Master of Engineering. Examinations will be held in each subject at the end of the year and each student will be required to undertake a project. The thesis will be subject to examination according to the regulations for the degree of Master of Engineering. 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.

FIRST YEAR.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lec. Lab.</td>
</tr>
<tr>
<td>6.305</td>
<td>Feedback Control Systems I</td>
<td>2</td>
</tr>
<tr>
<td>6.315</td>
<td>Analogue Computers</td>
<td>2 — 0</td>
</tr>
<tr>
<td>6.105</td>
<td>Advanced Mathematics</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

SECOND YEAR.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lec. Lab.</td>
</tr>
<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>
</tr>
</tbody>
</table>
SCHOOL OF MINING ENGINEERING AND APPLIED GEOLOGY.

Two courses leading to the degree of Bachelor of Engineering (Pass or Honours) are offered in the School of Mining Engineering and Applied Geology. The courses provided are:—

Course VII—Mining Engineering, a four years day course.
Conversion Course VIIc—Mining Engineering, for Associates of Sydney Technical College in Metalliferous Mining Engineering who desire to qualify for the degree of Bachelor of Engineering.

Two courses leading to the degree of Bachelor of Engineering (Geology) are also offered in this School. These courses are:—

Course VIIa—Applied Geology, a four years 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 having 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 specialised
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 specialise in either coal or metalliferous mining.

Specialisation 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 whole of 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 in relation to the Mines Department's requirements of practical training for candidates for Statutory Certificates of Competency.

**First Year.**

(24 weeks day course.)

<table>
<thead>
<tr>
<th>Hours per week.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Term 1</strong></td>
</tr>
<tr>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.41 Physics</td>
</tr>
<tr>
<td>2.111 Chemistry</td>
</tr>
<tr>
<td>5.11 Engineering Drawing</td>
</tr>
<tr>
<td>5.41 Descriptive Geometry</td>
</tr>
<tr>
<td>7.001 Mining Processes</td>
</tr>
<tr>
<td>7.511 Mineralogy</td>
</tr>
<tr>
<td>8.11 Engineering Mechanics</td>
</tr>
<tr>
<td>10.11 Mathematics</td>
</tr>
<tr>
<td>G10 English</td>
</tr>
<tr>
<td><strong>15 —14½</strong></td>
</tr>
</tbody>
</table>

* 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.)

### Hours per week.

<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>1.42 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>
</tr>
<tr>
<td>5.32 Engineering Mechanics</td>
<td>1⅓ — 1*</td>
<td>1⅓ — 1*</td>
</tr>
<tr>
<td>5.72 Thermodynamics</td>
<td>1 — 1-1*</td>
<td>1 — 1-1*</td>
</tr>
<tr>
<td>7.002 Coal Mining</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>7.042 Mining Science</td>
<td>1 — 1</td>
<td>1 — 1</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>1⅔ — 1*</td>
<td>1⅔ — 1*</td>
</tr>
<tr>
<td>8.92 Properties of Materials</td>
<td>0 — 0</td>
<td>1 — 2</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></td>
<td>16⅔—12½</td>
<td>17⅔—14⅔</td>
</tr>
</tbody>
</table>

* Tutorial.

**Note.**—Field excursions will be arranged on several Saturdays in connection with the instruction in Geology.

## THIRD YEAR.

(24 weeks day course.)

### Hours per week.

<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>5.52 Fluid Mechanics</td>
<td>1 — 1*</td>
<td>1 — 1*</td>
</tr>
<tr>
<td>6.83 Electrical Engineering</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
<tr>
<td>7.013 Metalliferous Mining</td>
<td>3 — 3</td>
<td>3 — 0</td>
</tr>
<tr>
<td>7.023 Mining</td>
<td>2 — 0</td>
<td>2 — 3</td>
</tr>
<tr>
<td>7.633 Geology</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
<tr>
<td>8.122 Structures</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>8.43 Surveying</td>
<td>1½ — 2</td>
<td>1 — 2</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>
</tr>
<tr>
<td></td>
<td>16⅔—14</td>
<td>16—14</td>
</tr>
</tbody>
</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 lec.</th>
<th>lab./tut.</th>
<th>Term 2 lec.</th>
<th>lab./tut.</th>
<th>Term 3 lec.</th>
<th>lab./tut.</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.004</td>
<td>Advanced Mining Techniques</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.024</td>
<td>Mining Engineering</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.034</td>
<td>Mineral Dressing</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.044</td>
<td>Mining</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.054</td>
<td>Assaying</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.064</td>
<td>Mineral Economics</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.534</td>
<td>Mining Geology</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.44</td>
<td>Surveying</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.45</td>
<td>Mine Surveying</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Advanced Elective (Humanities or Social Science) 2 — 0 2 — 0 0 — 0
First Aid 0 — 0 0 — 0 1 — 0

14 — 10 14 — 10 7 — 5

Seminars will be arranged during the course of the year.
During the third term of the fourth year students will devote time to the professional elective subjects and the preparation of their thesis.

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.

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</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.41</td>
<td>Physics</td>
<td>3 - 3</td>
<td>3 - 3</td>
</tr>
<tr>
<td>2.111</td>
<td>Chemistry</td>
<td>3 - 3</td>
<td>3 - 0</td>
</tr>
<tr>
<td>5.11</td>
<td>Engineering Drawing</td>
<td>0 - 3*</td>
<td>0 - 3*</td>
</tr>
<tr>
<td>5.41</td>
<td>Descriptive Geometry</td>
<td>1 - 2½*</td>
<td>1 - 2½*</td>
</tr>
<tr>
<td>7.001</td>
<td>Mining Processes</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>7.511</td>
<td>Mineralogy</td>
<td>0 - 0</td>
<td>1 - 1</td>
</tr>
<tr>
<td>8.11</td>
<td>Engineering Mechanics</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>10.11</td>
<td>Mathematics</td>
<td>4 - 2*</td>
<td>4 - 2*</td>
</tr>
<tr>
<td>G10</td>
<td>English</td>
<td>2 - 0</td>
<td>2 - 0</td>
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</tbody>
</table>

**Tutorial.**

### SECOND YEAR

(24 weeks day course.)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.42</td>
<td>Physics</td>
<td>2 - 2½</td>
<td>2 - 2½</td>
</tr>
<tr>
<td>2.32A</td>
<td>Physical Chemistry</td>
<td>1 - 2½</td>
<td>1 - 2½</td>
</tr>
<tr>
<td>7.052</td>
<td>Mining Engineering Practice</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>7.054</td>
<td>Assaying</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td>7.502</td>
<td>Geology</td>
<td>2 - 1</td>
<td>2 - 1</td>
</tr>
<tr>
<td>7.512</td>
<td>Mineralogy and Crystallography</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td>10.12</td>
<td>Mathematics</td>
<td>3 - 2*</td>
<td>3 - 2*</td>
</tr>
<tr>
<td>G20</td>
<td>History</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
</tbody>
</table>

**Tutorial.**

**NOTE.**—Geological excursions will be held during first and second terms.

### THIRD YEAR

(24 weeks day course.)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.503</td>
<td>Petrology</td>
<td>2 - 3</td>
<td>2 - 3</td>
</tr>
<tr>
<td>7.513</td>
<td>Advanced Mineralogy</td>
<td>2 - 2</td>
<td>0 - 0</td>
</tr>
<tr>
<td>7.523</td>
<td>Stratigraphy and Palaeontology</td>
<td>1 - 3</td>
<td>1 - 3</td>
</tr>
<tr>
<td>7.533</td>
<td>Economic Geology</td>
<td>2 - 2</td>
<td>2 - 2</td>
</tr>
<tr>
<td>7.543</td>
<td>Geophysics</td>
<td>2 - 1</td>
<td>2 - 0</td>
</tr>
<tr>
<td>7.553</td>
<td>Geology of Fuels</td>
<td>0 - 0</td>
<td>2 - 2</td>
</tr>
<tr>
<td>8.43</td>
<td>Surveying</td>
<td>1½ - 2</td>
<td>1½ - 2</td>
</tr>
<tr>
<td>8.63A</td>
<td>Engineering Construction</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>8.73H</td>
<td>Soil Mechanics and Hydrology</td>
<td>1 - 1½</td>
<td>1 - 0</td>
</tr>
<tr>
<td>G30</td>
<td>Philosophy</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td></td>
<td>Social Science Elective</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
</tbody>
</table>

**Hours per week.**

**Third Year.**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>16½ - 14½</td>
<td>16½ - 12</td>
</tr>
</tbody>
</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>Course</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.034 Mineral Dressing</td>
<td>2 — 3</td>
<td>2 — 3</td>
</tr>
<tr>
<td>7.064 Mineral Economics</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>7.504 Advanced Petrology</td>
<td>1 — 2</td>
<td>0 — 0</td>
</tr>
<tr>
<td>7.534 Mining Geology</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>7.564 Photogrammetry and Photogeology</td>
<td>1 — 1</td>
<td>0 — 2</td>
</tr>
<tr>
<td>7.574 Engineering Geology</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>7.644 Geophysics and Geotectonics</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.66b Engineering Administration</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Elective Subjects</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or Social Science)</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

Total: 26 hours per week. 22 hours per week.

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. Industrial Mineralogy and Petrology.
2. Structural Geology and Geophysics.
3. Mining and Economic Geology.
4. Engineering Geology.

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 (Geology).
### 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>Engineering Mechanics</td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td>Mathematics, Part I</td>
<td>6—6½</td>
<td>6—6½</td>
<td>6—6½</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>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Chemistry</td>
<td>1—2½</td>
<td>1—2½</td>
<td>0—0</td>
</tr>
<tr>
<td>Assaying</td>
<td>0—0</td>
<td>0—0</td>
<td>0—5</td>
</tr>
<tr>
<td>Geology</td>
<td>2—1½</td>
<td>2—1½</td>
<td>2—1½</td>
</tr>
<tr>
<td>Mathematics, Part II</td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td>English</td>
<td>6½—4½</td>
<td>5½—4½</td>
<td>4½—7</td>
</tr>
</tbody>
</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>
</tr>
</thead>
<tbody>
<tr>
<td>Physics</td>
<td>1½—1½</td>
<td>2½—1½</td>
<td>2½—1½</td>
</tr>
<tr>
<td>Petrology</td>
<td>1—2</td>
<td>½—1</td>
<td>0—0</td>
</tr>
<tr>
<td>Mineralogy and Crystallography</td>
<td>1—2</td>
<td>1—2</td>
<td>1—2</td>
</tr>
<tr>
<td>Stratigraphy and Palaeontology</td>
<td>0—0</td>
<td>½—1</td>
<td>1—2</td>
</tr>
<tr>
<td>Surveying</td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>Mathematics, Part I</td>
<td>5½—6</td>
<td>6½—6</td>
<td>6½—6</td>
</tr>
</tbody>
</table>

* Tutorial.

**Note.**—A survey camp of one week's duration will be conducted in the third week of third term.

A Geology excursion of five day's 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></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>7.052 Mining Engineering Practice</td>
<td>1 - 0</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>7.503b Petrology</td>
<td>0 - 0</td>
<td>1/1 - 1</td>
<td>1 - 2</td>
</tr>
<tr>
<td>7.513 Advanced Mineralogy</td>
<td>2 - 2</td>
<td>0 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>7.523b Stratigraphy and Palaeontology</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>0 - 0</td>
</tr>
<tr>
<td>7.533 Economic Geology</td>
<td>1 - 1</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>7.553 Geology of Fuels</td>
<td>0 - 0</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>10.12 Mathematics, Part II</td>
<td>1 - 1/8</td>
<td>1 - 1/8</td>
<td>1 - 1/8</td>
</tr>
<tr>
<td>G20 History</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td></td>
<td>7 - 5 1/2</td>
<td>6 1/2 - 6 1/2</td>
<td>7 - 5 1/2</td>
</tr>
</tbody>
</table>

* Tutorial.

NOTE—A Geology excursion of five day's duration will be held during fourth year.

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></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>7.034 Mineral Dressing</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>1 - 2</td>
</tr>
<tr>
<td>7.504 Advanced Petrology</td>
<td>0 - 0</td>
<td>0 - 0</td>
<td>1 - 3</td>
</tr>
<tr>
<td>7.533 Economic Geology</td>
<td>1 - 1</td>
<td>0 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>7.543 Geophysics</td>
<td>1 - 1</td>
<td>2 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>7.564 Photogrammetry and</td>
<td>0 - 0</td>
<td>1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>Photogeology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.63A Engineering Construction</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>8.73D Soil Mechanics</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td></td>
<td>7 - 4</td>
<td>7 - 3</td>
<td>5 - 6</td>
</tr>
</tbody>
</table>

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></td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>7.064 Mineral Economics</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>7.534 Mining Geology</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td>0 - 0</td>
</tr>
<tr>
<td>7.574 Engineering Geology</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>7.644 Geophysics and Geotectonics</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>8.66B Engineering Administration</td>
<td>1 - 0</td>
<td>0 - 0</td>
<td>0 - 0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Electives and Thesis†</td>
<td>3</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

† For details see page 176.
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 1957 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 return to work in the mines 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:—

<table>
<thead>
<tr>
<th>Hours per Week.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.42 Physics</strong></td>
</tr>
<tr>
<td>(Exemption may be granted if the student has completed Diploma Physics II.)</td>
</tr>
<tr>
<td><strong>8.122 Structures</strong></td>
</tr>
<tr>
<td><strong>7.002 Coal Mining</strong></td>
</tr>
<tr>
<td><strong>7.023 Mining Engineering</strong></td>
</tr>
<tr>
<td><strong>7.042 Mining Science</strong></td>
</tr>
<tr>
<td><strong>10.12 Mathematics</strong></td>
</tr>
</tbody>
</table>

Conversion Humanities—

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>English or History or Philosophy</td>
<td>2</td>
</tr>
<tr>
<td><em>and</em> Psychology or Economics or Government</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>24½</td>
</tr>
</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 189 to 193 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 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 one of the following options:

**Option I.**—Civil Engineering Design.

Emphasis is given to the design aspects of civil engineering works which follow up the initial survey and investigation and precede the actual construction of the project.

**Option II.**—Civil Engineering Construction and Administration.

The attention of the student is directed to the problems associated with the actual construction of major civil engineering projects of all types such as the planning of construction methods and the study of administrative, social and economic aspects of major projects.

**Option III.**—Surveys and Investigations.

Stress is laid in this option upon the preliminary investigation necessary for large civil engineering projects with special study of such subjects as photogrammetry, hydrology, soil mechanics and geology.

**Option IV.**—Materials.

The study of both the fundamentals of material behaviour and the experimental analysis of engineering materials and structures is a rapidly expanding branch of applied science. This option deals with the civil engineering aspects of this field.

### COURSE VIII—CIVIL ENGINEERING.

**FIRST YEAR.**

(24 weeks day course.)

<table>
<thead>
<tr>
<th>Year</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>Term 1</td>
<td>Term 2</td>
<td></td>
</tr>
<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 — 2*</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>
</tbody>
</table>

| 14 —14½ | 14 —11½ |

* Tutorial.

**NOTE.**—A survey camp of one week's duration must be attended in the third week of third term.
## SECOND YEAR.
### (24 weeks day course.)

<table>
<thead>
<tr>
<th>Subject</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>1.42 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>
</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 — 1—1*</td>
<td>1 — 1—1*</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>Subject</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>5.12 Mechanical Engineering Design</td>
<td>0 — 3*</td>
<td>0 — 3*</td>
</tr>
<tr>
<td>6.83 Electrical Engineering</td>
<td>1 — 3—1*</td>
<td>1 — 3—1*</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>1 — 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>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16 —15½</td>
<td>15½—15½</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</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>S.114 Structures</td>
<td>2 — 3</td>
</tr>
<tr>
<td>S.33 Engineering Computations</td>
<td>1½ — 0</td>
</tr>
<tr>
<td>8.44 Surveying</td>
<td>2 — 2</td>
</tr>
<tr>
<td>8.54 Applied Hydraulics</td>
<td>1 — 1*</td>
</tr>
<tr>
<td>8.64A Public Health Engineering</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.64B Road Engineering</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.65A Railway Engineering</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.65B Harbours and Rivers Engineering</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.65C Irrigation Engineering</td>
<td>0 — 0</td>
</tr>
<tr>
<td>8.65D Hydro-Electric Engineering</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.65A Engineering Construction</td>
<td>2 — 0</td>
</tr>
<tr>
<td>8.65B Engineering Administration</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.84 Town and Country Planning</td>
<td>2 — 0</td>
</tr>
<tr>
<td>8.94 Properties of Materials</td>
<td>0 — 0</td>
</tr>
<tr>
<td>11.82A Theory of Architecture</td>
<td>1 — 0</td>
</tr>
</tbody>
</table>

Six hours per week for 3 terms consisting of 2 hours lecture and 4 hours laboratory, drawing office or tutorial.

Advanced Elective (Humanities or Social Science) 2 — 0 2 — 0

20½—10 17½—12

* 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 one of the following options. Within each option the student is required to select two subjects with the approval of the Head of the School. The work in these electives will be mainly carried out on the tutor
system. Students may be instructed to attend certain lectures given by learned societies and other educational authorities during the year. The electives within each option are as follow:

**Option 1—Civil Engineering Design.**

(a) Theory and Design of Structures.
(b) Soil Mechanics and Foundation Engineering.
(c) Hydrology.
(d) Hydraulics.
(e) Advanced Mathematics.
(f) Modern Foreign Language.

**Option 2—Civil Engineering Construction and Administration.**

(a) Construction Equipment and Methods.
(b) Geology.
(c) Management.
(d) Road Engineering.
(e) Public Health Engineering.

**Option 3—Surveys and Investigations.**

(a) Astronomy and Geodesy.
(b) Topographical Surveying, Aerial Surveying and Photogrammetry.
(c) Soil Mechanics.
(d) Hydrology.
(e) Hydraulics.
(f) Geology.

**Option 4—Materials.**

(a) Soil Mechanics.
(b) Concrete Technology.
(c) Advanced Mechanics of Materials.
(d) Photoelasticity and Experimental Stress Analysis.
(e) Advanced Mathematics.
(f) Modern Foreign Language.
**COURSE VIIIB—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></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 Engineering Drawing</td>
<td>0 — 3*</td>
<td>0 — 3*</td>
<td>0 — 3*</td>
</tr>
<tr>
<td>5.41d Descriptive Geometry†</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>8.11d Engineering Mechanics</td>
<td>1½ — ½*</td>
<td>1½ — ½*</td>
<td>1½ — ½*</td>
</tr>
<tr>
<td>10.11 Mathematics, Part I</td>
<td>6 — 6½</td>
<td>6 — 6½</td>
<td>6 — 6½</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></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>4.912d Materials Technology</td>
<td>1 — 1½</td>
<td>1 — 1½</td>
<td>1 — 1½</td>
</tr>
<tr>
<td>7.502 Geology</td>
<td>1 — 1</td>
<td>1 — 1</td>
<td>2 — 0</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>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></td>
<td>7 — 3½</td>
<td>6 — 3½</td>
<td>5½ — 2</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 Description</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Engineering Design</td>
<td>0 — 2</td>
<td>0 — 2</td>
<td>0 — 0</td>
</tr>
<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>
</tr>
<tr>
<td>Structures</td>
<td>1 — 1</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>Surveying</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0  (1 term)</td>
</tr>
<tr>
<td>Properties of Materials</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Mathematics, Part I</td>
<td>1 — 1*</td>
<td>1 — 1*</td>
<td>1 — 1*</td>
</tr>
</tbody>
</table>

\[ \frac{5 \text{ - } 5 \frac{1}{2}}{} \frac{5 \text{ - } 5 \frac{1}{2}}{} \frac{3 \text{ - } 4 \text{ - } 5 \frac{1}{2}}{} \]

*Tutorial.

**Note:** Seven Saturdays (a total of 42 hours) will be devoted to Surveying field work. Third year students may apply to attend the survey camp of one week's duration to be held in the third week of third term in lieu of Saturday work.

### FOURTH YEAR.

(34 weeks part-time course.)

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structures</td>
<td>1 — 1</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>Materials of Construction</td>
<td>1 — 1</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>0 — 1</td>
</tr>
<tr>
<td>Engineering Construction</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Soil Mechanics</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>0 — 3</td>
</tr>
<tr>
<td>Statistics</td>
<td>2 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>History</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>2 — 0</td>
</tr>
</tbody>
</table>

\[ \frac{8 \text{ - } 3}{7 \text{ - } 3} \frac{4 \text{ - } 7 \frac{1}{2}}{} \]

### FIFTH YEAR.

(34 weeks part-time course.)

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Engineering</td>
<td>1 — 1</td>
<td>1 — 1</td>
<td>1 — 1</td>
</tr>
<tr>
<td>Surveying</td>
<td>( \frac{1}{2} ) — 0</td>
<td>( \frac{3}{2} )</td>
<td>1 ( \frac{1}{2} )</td>
</tr>
<tr>
<td>Hydrology</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>1 ( \frac{1}{2} )</td>
</tr>
<tr>
<td>Public Health Engineering</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Road Engineering</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Railway Engineering</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Harbours and Rivers Engineering</td>
<td>1 — 0</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Irrigation Engineering</td>
<td>0 — 0</td>
<td>1 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Hydro-Electric Engineering</td>
<td>1 — 0</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Town and Country Planning</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Properties of Materials</td>
<td>0 — 0</td>
<td>1 — 2</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Seminar</td>
<td>0 — 0</td>
<td>0 — 0</td>
<td>3 — 0</td>
</tr>
</tbody>
</table>

\[ \frac{8 \frac{1}{2} — 1 \frac{1}{2}}{} \frac{8 \frac{1}{2} — 3 \frac{1}{2}}{} \frac{7 \frac{1}{2} — 1 \frac{1}{2}}{} \]

**Note:** Seven Saturdays (a total of 42 hours) will be devoted to Surveying field work.
### SIXTH YEAR.

**(34 weeks part-time 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>1.42D Physics</td>
<td>1½—1½</td>
<td>2½—1½</td>
<td>2½—1½</td>
</tr>
<tr>
<td>7.673 Engineering Geology</td>
<td>1—0</td>
<td>0—0</td>
<td>0—0</td>
</tr>
<tr>
<td>8.114 Structures</td>
<td>2—1½</td>
<td>2—1½</td>
<td>2—1½</td>
</tr>
<tr>
<td>8.54 Applied Hydraulics</td>
<td>1½—0</td>
<td>1—1*</td>
<td>1—0</td>
</tr>
<tr>
<td>10.12 Mathematics, Part II</td>
<td>1—½*</td>
<td>1—½*</td>
<td>1—½*</td>
</tr>
<tr>
<td>11.82A Theory of Architecture</td>
<td>0—0</td>
<td>0—0</td>
<td>1½—0</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>2—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
</tbody>
</table>

**NOTE.**—Students are required to attend a Survey Camp of one week's duration held in third week of third term.

### SEVENTH YEAR.

**(34 weeks part-time 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>8.33 Engineering Computations</td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>8.66A Engineering Construction</td>
<td>1—0</td>
<td>1—0</td>
<td>0—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>Professional Elective A</td>
<td>1—2</td>
<td>1—2</td>
<td>1—2</td>
</tr>
<tr>
<td>Professional 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>Social Science Elective</td>
<td>2—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
</tbody>
</table>

**NOTE.**—Students are required to attend a Survey Camp of one week's duration held in third week of third term.

### CONVERSION COURSE VIII—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></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>Term 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.42D Physics</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
</tr>
<tr>
<td>† Conversion Theory of Structures</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Conversion Soil Mechanics</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Conversion Materials of Construction</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Term 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 Mathematics</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Conversion Humanities (English or History or Philosophy)</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Term 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$6\frac{1}{2}$</td>
<td>$7\frac{1}{2}$</td>
<td>$8\frac{1}{2}$</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></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</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8.54 Applied Hydraulics</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8.63B Hydrology*</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8.64A Public Health Engineering*</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.64B Road Engineering*</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.65A Railway Engineering*</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8.65B Harbours and Rivers Engineering*</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.65C Irrigation Engineering*</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.65D Hydro-Electric Engineering</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>8.84 Town and Country Planning*</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10.43 Statistics</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Conversion Humanities (Psychology or Economics or Government)</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>
THIRD YEAR.

(34 weeks evening course.)

Hours per week.

<table>
<thead>
<tr>
<th>Properties of Materials</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>Elective A</td>
<td>1 — 2</td>
<td>0 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>Elective B</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>Thesis</td>
<td>0 — 3</td>
<td>0 — 3</td>
<td>0 — 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 — 9</td>
<td>2 — 7</td>
<td>2 — 7</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.)

Hours per week.

<table>
<thead>
<tr>
<th>Physics</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.41</td>
<td>3 — 3</td>
<td>3 — 3</td>
</tr>
<tr>
<td>Chemistry</td>
<td>3 — 3</td>
<td>3 — 0</td>
</tr>
<tr>
<td>Descriptive Geometry</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>Plotting and Plan Drawing</td>
<td>0 — 3</td>
<td>0 — 3</td>
</tr>
<tr>
<td>Surveying</td>
<td>1 — 1½</td>
<td>1½ — 1½</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4 — 2</td>
<td>4 — 2</td>
</tr>
<tr>
<td>English</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td>14 —15</td>
<td>14½—12</td>
</tr>
</tbody>
</table>

Note.—A survey camp of two weeks' duration must be attended during the year.
### SECOND YEAR

(24 weeks day course.)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.42</td>
<td>Physics</td>
<td>2 - 2 1/2</td>
<td>2 - 2 1/2</td>
<td></td>
</tr>
<tr>
<td>5.52</td>
<td>Fluid Mechanics</td>
<td>1 - 1*</td>
<td>1 - 1*</td>
<td></td>
</tr>
<tr>
<td>7.502</td>
<td>Geology*</td>
<td>2 - 1</td>
<td>2 - 1</td>
<td></td>
</tr>
<tr>
<td>8.412</td>
<td>Surveying</td>
<td>2 - 2</td>
<td>2 - 2</td>
<td></td>
</tr>
<tr>
<td>8.422</td>
<td>Survey Computations</td>
<td>1 - 1 1/2</td>
<td>1 - 1 1/2</td>
<td></td>
</tr>
<tr>
<td>8.432</td>
<td>Land Utilization</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td></td>
</tr>
<tr>
<td>8.442</td>
<td>Astronomy</td>
<td>2 - 3</td>
<td>0 - 0</td>
<td></td>
</tr>
<tr>
<td>8.452</td>
<td>Geodesy</td>
<td>0 - 0</td>
<td>2 - 3</td>
<td></td>
</tr>
<tr>
<td>10.12</td>
<td>Mathematics</td>
<td>3 - 2*</td>
<td>3 - 2*</td>
<td></td>
</tr>
<tr>
<td>G20</td>
<td>History</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td></td>
</tr>
</tbody>
</table>

| Total       |                     | 17 - 13        | 16 - 13 |

* Tutorial.

**Note.**—A survey camp of two weeks’ duration must be attended during the year. 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 Code</th>
<th>Course Name</th>
<th>Hours per week</th>
<th>Term 1</th>
<th>Term 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.23B</td>
<td>Physical Techniques IV (Optical Design)</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td></td>
</tr>
<tr>
<td>7.673</td>
<td>Engineering Geology</td>
<td>0 - 0</td>
<td>1 - 0</td>
<td></td>
</tr>
<tr>
<td>8.413</td>
<td>Surveying</td>
<td>1 - 2</td>
<td>1 - 2</td>
<td></td>
</tr>
<tr>
<td>8.423</td>
<td>Survey Computations</td>
<td>1 - 2</td>
<td>1 - 1</td>
<td></td>
</tr>
<tr>
<td>8.443</td>
<td>Astronomy</td>
<td>1 1/2 - 1 1/2</td>
<td>1 1/2 - 1 1/2</td>
<td></td>
</tr>
<tr>
<td>8.463</td>
<td>Mathematics for Surveyors</td>
<td>2 - 1 1/2</td>
<td>2 - 2</td>
<td></td>
</tr>
<tr>
<td>8.473</td>
<td>Photogrammetry</td>
<td>3 - 0</td>
<td>1 1/2 - 4</td>
<td></td>
</tr>
<tr>
<td>8.63A</td>
<td>Engineering Construction</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td></td>
</tr>
<tr>
<td>8.63B</td>
<td>Hydrology</td>
<td>1 - 0</td>
<td>1 1/2 - 0</td>
<td></td>
</tr>
<tr>
<td>8.63C</td>
<td>Hydrology</td>
<td>0 - 0</td>
<td>1 1/2 - 0</td>
<td></td>
</tr>
<tr>
<td>8.73</td>
<td>Soil Mechanics</td>
<td>1 - 1 1/2</td>
<td>1 - 1 1/2</td>
<td></td>
</tr>
<tr>
<td>10.43</td>
<td>Statistics</td>
<td>2 - 0</td>
<td>1 - 0</td>
<td></td>
</tr>
<tr>
<td>G30</td>
<td>Philosophy</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td></td>
</tr>
<tr>
<td>Social Science Elective</td>
<td></td>
<td>2 - 0</td>
<td>2 - 0</td>
<td></td>
</tr>
</tbody>
</table>

| Total       |                     | 18 1/2 - 8 1/2 | 18 - 12 |

**Note.**—A survey camp of two weeks’ duration must be attended during the year. A geology camp of one week’s duration must also be attended.
**FOURTH 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>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>1.23D Physical Techniques (Instrument Design)</strong></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>7.542 Geophysics</strong></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>8.404 Map Compilation and Reproduction</strong></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>8.453 Geodesy</strong></td>
<td>2</td>
<td>1 1/2</td>
</tr>
<tr>
<td><strong>8.454 Map Projections</strong></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>8.474 Photogrammetry</strong></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>8.484 Land Valuation</strong></td>
<td>1 1/2</td>
<td>0</td>
</tr>
<tr>
<td><strong>8.494 Survey Laws and Regulations</strong></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>8.64A Road Engineering</strong></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>8.65A Railway Engineering</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>8.65B Harbours and Rivers Engineering</strong></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>8.65D Irrigation Engineering</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>8.66A Engineering Construction</strong></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>8.84 Town and Country Planning</strong></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Advanced Elective (Humanities or Social Science)</strong></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Thesis and Seminar</strong></td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

Total: 21 1/2 - 8 1/2

18 1/2 - 10 1/2

0 - 10

NOTE.—A survey camp of two weeks' duration must be attended during the year. 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 VIIISt—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>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>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>1.41D Physics</strong></td>
<td>1 1/4</td>
<td>1 1/4</td>
</tr>
<tr>
<td><strong>2.111 Chemistry</strong></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>5.41D Descriptive Geometry</strong></td>
<td>0</td>
<td>3</td>
</tr>
<tr>
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<tr>
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</table>

* Tutorial.

NOTE.—Seven Saturdays (a total of 42 hours) will be devoted to Surveying fieldwork.
### 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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<tbody>
<tr>
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* Tutorial.

**Note:** Eight Saturdays (a total of 48 hours) will be devoted to Surveying fieldwork. Field excursions will be arranged on several Saturdays in connection with instruction in Geology.

### Third Year

(34 weeks part-time course)

<table>
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<th>Course</th>
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<th>Term 3</th>
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<td><strong>Term 1</strong></td>
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<tr>
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<tr>
<td>8.432 Land Utilization</td>
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<td>8.42D Surveying Computations</td>
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</table>

* Tutorial.

**Note:** Seven Saturdays (a total of 42 hours) will be devoted to Surveying fieldwork. Field excursions will be arranged on several Saturdays in connection with instruction in Land Utilization.

### 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>
</tr>
</thead>
<tbody>
<tr>
<td>Hours per week</td>
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<tr>
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<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8.73D Soil Mechanics</td>
<td>1</td>
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</tr>
<tr>
<td>8.443 Astronomy</td>
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<tr>
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<tr>
<td>8.73D Soil Mechanics</td>
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<tr>
<td>8.443 Astronomy</td>
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</tr>
<tr>
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<td>8.63A Engineering Construction</td>
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* Tutorial.
### FIFTH YEAR

(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course Code</th>
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<td>Survey Laws and Regulations</td>
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<td>8.63B</td>
<td>Hydrology</td>
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Total: 11\frac{1}{3} — 0 8\frac{1}{2} — 3\frac{1}{3} 6 — 3

**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>
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<td>8.454</td>
<td>Map Projections</td>
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<td>G30</td>
<td>Philosophy</td>
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Total: 8\frac{1}{2} — 3 7 — 3 5 — 2\frac{1}{2}

**Note:** Students must attend a survey camp of two week's duration during the year 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 Title</th>
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<th>Term 2</th>
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Total: 8 — 4 7 — 5 2 — 6

*5112—7  K5137*
GRADUATE COURSES.

The School of Civil Engineering proposes to offer in 1957 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 Computation.
8.117 Use of Models in Structural Analysis.
8.118 Analysis of Concrete Shell Roofs.
8.119 Prestressed Concrete Design.
8.215 Concrete Technology.
8.415 Advanced Surveying, Astronomy and Geodesy.
8.416 Photogrammetry.
8.515 Hydrodynamics.
8.516 Advanced Hydraulics.
8.517 Hydraulic Design.
8.518 Hydro-Electric Engineering.
8.519 Hydrology.
8.715 Soil Mechanics.
8.915 Experimental Stress Analysis.
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.

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></th>
<th>Hours per week.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Term 1 and 2</td>
</tr>
<tr>
<td></td>
<td>lec. lab./tut.</td>
</tr>
<tr>
<td>1.41 Physics</td>
<td>3 — 3</td>
</tr>
<tr>
<td>2.41b General Chemistry</td>
<td>3 — 6</td>
</tr>
<tr>
<td>10.91 Mathematics</td>
<td>4 — 2*</td>
</tr>
<tr>
<td>17.11 Biochemistry</td>
<td>0 — 0</td>
</tr>
<tr>
<td>17.21 General Biology</td>
<td>2 — 3</td>
</tr>
<tr>
<td>G10 English</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G20 History</td>
<td>1 — 0</td>
</tr>
</tbody>
</table>

= Tutorial.
### SECOND YEAR

(24 weeks day course.)

<table>
<thead>
<tr>
<th>Term</th>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.12</td>
<td>Livestock Production I</td>
<td>3 - 0</td>
</tr>
<tr>
<td>9.22</td>
<td>Agronomy</td>
<td>3 - 0</td>
</tr>
<tr>
<td>9.42</td>
<td>General Textiles (Yarns)</td>
<td>1 - 2</td>
</tr>
<tr>
<td>9.52</td>
<td>Wool</td>
<td>1 - 6</td>
</tr>
<tr>
<td>10.92</td>
<td>Statistics</td>
<td>2 - 1</td>
</tr>
<tr>
<td>17.12</td>
<td>Biochemistry</td>
<td>2 - 3</td>
</tr>
<tr>
<td>17.22</td>
<td>Biology</td>
<td>2 - 0</td>
</tr>
<tr>
<td>G30</td>
<td>Philosophy</td>
<td></td>
</tr>
</tbody>
</table>

Total: 16 - 15

21 weeks for remainder of year to be spent in activities concerned with wool production.

### THIRD YEAR

(24 weeks day course.)

<table>
<thead>
<tr>
<th>Term</th>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.13</td>
<td>Livestock Production IIa</td>
<td>3 - 0</td>
</tr>
<tr>
<td>9.13</td>
<td>Livestock Production IIb</td>
<td>3 - 0</td>
</tr>
<tr>
<td>9.33</td>
<td>Economics</td>
<td>2 - 0</td>
</tr>
<tr>
<td>9.43</td>
<td>General Textiles (Fabrics)</td>
<td>1 - 3</td>
</tr>
<tr>
<td>9.53</td>
<td>Wool</td>
<td>0 - 9</td>
</tr>
<tr>
<td>17.61</td>
<td>Physiology</td>
<td>2 - 3</td>
</tr>
<tr>
<td></td>
<td>Social Science Elective</td>
<td>2 - 0</td>
</tr>
</tbody>
</table>

Total: 13 - 15

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.)

Hours per week.
Terms 1, 2 and 3
lec. lab./tut.

9.74 Fibre Science ......................................... 2 — 2
9.84 Project .................................................. 0 — 5

Advanced Elective (Humanities or Social
Science).................................................. 2 — 0 (Terms 2 and 3)

2 — 4 — 7

Plus elective subjects of either Option I or Option II.

Option I.—Wool Production.

9.94 Genetics ................................................. 2 — 1
9.104 Nutrition ................................................. 3 — 2
9.124 Farm Management and Mechanisation ...... 3 — 0
9.14 Livestock Production III ......................... 2 — 0
9.24 Pastoral Agronomy ..................................... 2 — 2

12 — 5

Option II.—Wool Commerce.

9.134 Introductory Accounting ............................ 2 — 2*
9.144 Commercial Law ......................................... 2 — 0
9.154 Synthetic Fibres ....................................... 1 — 0
9.34 Banking, Currency, Foreign Exchange .......... 2 — 0
9.44 Yarn Manufacture (Wool) ............................. 6 — 0
9.54 Wool ..................................................... 5 — 0

18 — 2

* Tutorial.
SCHOOL OF ARCHITECTURE AND BUILDING.

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 work.

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 more 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 Architectural Studies and Design) and later with more advanced work on architectural design and construction, civic design, etc.
Further, two principles established by the University of Technology as 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. Practical employment is included during the third term of first year, and throughout all the subsequent years, and before the degree is conferred the student must provide evidence of at least four years’ approved practical experience. The lectures in the Humanities and the Fine Arts are also an integral part of the course.

COURSE XI—ARCHITECTURE.

The course in Architecture was revised as from 1952, and the revised course as set out below replaced the original course year by year commencing with the first year in 1952. Details of the original course may be found in the 1951 Calendar.

FIRST YEAR.

(24 weeks full-time course covering first and second terms and 10 weeks part-time course of two half days and two or three evenings per week covering third term.)

<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>2 — 0</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td>11.101 Theory of Structures I</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 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 Freehand Drawing and Presentation I</td>
<td>0 — 6</td>
<td>0 — 6</td>
<td>0 — 3</td>
</tr>
<tr>
<td>11.41 History of Architecture I</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>11.61 Building Trades and Crafts (Equiv. time)</td>
<td>0 — 1½</td>
<td>0 — 1½</td>
<td>0 — 1½</td>
</tr>
<tr>
<td>11.71 Building Construction I</td>
<td>1 — 4</td>
<td>1 — 4</td>
<td>1 — 2</td>
</tr>
<tr>
<td>11.91 Building Science</td>
<td>2 — 2</td>
<td>2 — 2</td>
<td>1 — 0</td>
</tr>
<tr>
<td>G10 English</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>0 — 0</td>
</tr>
<tr>
<td></td>
<td>11 — 17½</td>
<td>11 — 17½</td>
<td>4 — 8½</td>
</tr>
</tbody>
</table>

For the subject 11.61 Building Trades and Crafts, groups of students will be formed, studying for the equivalent time stated for one and a half terms.
SECOND YEAR.

(34 weeks part-time course over three terms requiring attendance for two half days or one full day and three 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>8.23 Materials of Construction</td>
<td>1-0</td>
<td>0-2</td>
<td>1-0</td>
</tr>
<tr>
<td>(Equivalent time)</td>
<td>0-</td>
<td>0-</td>
<td>0-</td>
</tr>
<tr>
<td>8.42 Land Surveying (Equiv. 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>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>11.23 Freehand Drawing and Presentation II</td>
<td>0-2</td>
<td>0-2</td>
<td>0-2</td>
</tr>
<tr>
<td>11.32 Architectural Studies and Design</td>
<td>0-1</td>
<td>0-1</td>
<td>0-1</td>
</tr>
<tr>
<td>11.42 History of Architecture II</td>
<td>1-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>11.52 Building Science</td>
<td>1-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>11.72 Building Construction II</td>
<td>1-1</td>
<td>0-2</td>
<td>0-1</td>
</tr>
<tr>
<td>11.82 Theory of Architecture A</td>
<td>1-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>G20 History</td>
<td>2-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>Total</td>
<td>8-6</td>
<td>6-6</td>
<td>4-8</td>
</tr>
</tbody>
</table>

For the subject 8.42 Land Surveying, groups of students will be formed, studying for 12 hours' theory in the School and 24 hours' practical outdoor on Saturday mornings. Time stated is equivalent time per week.

THIRD YEAR.

(34 weeks part-time course requiring attendance for two half days or one full day and three 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>7.703 Geology</td>
<td>1-0</td>
<td>1-0</td>
<td>0-4</td>
</tr>
<tr>
<td>11.103 Theory of Structures III</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>11.203 Building Services and Equipment A</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>11.43 History of Architecture III</td>
<td>1-0</td>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>11.73 Building Construction III</td>
<td>1-1</td>
<td>1-1</td>
<td>1-1</td>
</tr>
<tr>
<td>11.83 Theory of Architecture B</td>
<td>1-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>11.93 Architectural Design and Construction A</td>
<td>0-5</td>
<td>0-5</td>
<td>0-5</td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>2-0</td>
<td>2-0</td>
<td>0-0</td>
</tr>
<tr>
<td>Total</td>
<td>8-6</td>
<td>8-6</td>
<td>5-10</td>
</tr>
</tbody>
</table>
FOURTH YEAR.

(34 weeks part-time course requiring attendance for one half day and three evenings per week in terms 1 and 2 and three evenings per week in term 3.)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11.104 Structures A</td>
<td>2 - 0</td>
<td>0</td>
<td>2 - 0</td>
<td>0</td>
<td>2 - 0</td>
<td>0</td>
</tr>
<tr>
<td>11.144 Building Research Review</td>
<td>0 - 0</td>
<td>0</td>
<td>0 - 0</td>
<td>0</td>
<td>1 - 0</td>
<td>0</td>
</tr>
<tr>
<td>11.164 Acoustics and Sound Insulation</td>
<td>1 - 0</td>
<td>0</td>
<td>0 - 0</td>
<td>0</td>
<td>0 - 0</td>
<td>0</td>
</tr>
<tr>
<td>11.204 Building Services and Equipment B</td>
<td>2 - 0</td>
<td>2</td>
<td>2 - 0</td>
<td>2</td>
<td>2 - 0</td>
<td>2</td>
</tr>
<tr>
<td>11.94 Architectural Design and Construction B</td>
<td>0 - 3</td>
<td>0</td>
<td>0 - 3</td>
<td>0</td>
<td>0 - 4</td>
<td>0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2 - 0</td>
<td>2</td>
<td>2 - 0</td>
<td>2</td>
<td>0 - 0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>7 - 3</td>
<td>6</td>
<td>6 - 3</td>
<td>6</td>
<td>5 - 4</td>
<td>4</td>
</tr>
</tbody>
</table>

FIFTH YEAR.

(34 weeks part-time course requiring attendance for three evenings per week.)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11.105 Structures B or Planning Research</td>
<td>1 - 1</td>
<td>1</td>
<td>1 - 1</td>
<td>1</td>
<td>1 - 1</td>
<td>1</td>
</tr>
<tr>
<td>11.125 Professional Practice</td>
<td>1 - 0</td>
<td>1</td>
<td>1 - 0</td>
<td>1</td>
<td>1 - 0</td>
<td>1</td>
</tr>
<tr>
<td>11.135 Specifications</td>
<td>1 - 0</td>
<td>1</td>
<td>1 - 0</td>
<td>1</td>
<td>1 - 0</td>
<td>1</td>
</tr>
<tr>
<td>11.215 Estimating</td>
<td>1 - 0</td>
<td>1</td>
<td>1 - 0</td>
<td>1</td>
<td>1 - 0</td>
<td>1</td>
</tr>
<tr>
<td>11.95 Architectural Design and Construction C</td>
<td>0 - 3</td>
<td>0</td>
<td>0 - 3</td>
<td>0</td>
<td>0 - 3</td>
<td>0</td>
</tr>
<tr>
<td>G70 Painting, Sculpture and Allied Arts</td>
<td>2 - 0</td>
<td>2</td>
<td>2 - 0</td>
<td>2</td>
<td>0 - 0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>6 - 4</td>
<td>6</td>
<td>6 - 4</td>
<td>6</td>
<td>4 - 4</td>
<td>4</td>
</tr>
</tbody>
</table>
(34 weeks course requiring attendance for twelve weeks full-time for one term, and part-time attendance for one or two evenings per week for two terms. The hours are for regular attendance at the school, and do not give the total hours involved on the research or design projects.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.126 Professional Practice</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>(Advanced)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.176 Architectural Science</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>and Research Thesis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.186 Civic Architecture</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11.196 Town Planning</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11.98 Architectural Design</td>
<td>0</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>and Construction D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>20</td>
<td>2</td>
</tr>
</tbody>
</table>

* Equivalent time.

CONVERSION COURSE XIc—ARCHITECTURE.

Holders of the diploma in Architecture are required to complete the following additional work in order to qualify for the degree of Bachelor of Architecture.

<table>
<thead>
<tr>
<th>Hours per week.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>1. Conversion Humanities—</td>
</tr>
<tr>
<td>English or History or Philosophy.......... 2</td>
</tr>
<tr>
<td>and Psychology or Economics or Government... 2</td>
</tr>
<tr>
<td>2. 11.176 Architectural Science and Research Thesis* 24 (Term 1)</td>
</tr>
<tr>
<td>3. Any two of the following:—</td>
</tr>
<tr>
<td>1.91 Physics 4 (Terms 1 and 2)</td>
</tr>
<tr>
<td>11.91 Building Science 4 (Terms 1 and 2)</td>
</tr>
<tr>
<td>10.51 Mathematics 2 (Terms 1 and 2)</td>
</tr>
<tr>
<td>8.22 Materials of Construction 2 (Terms 1 and 2)</td>
</tr>
<tr>
<td>7.502 Geology 4 (Term 3)</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.

Three courses in Applied Psychology are offered: Course XIIb, a five-year part-time course leading to the degree of Bachelor of Science in Psychology, and Courses XIIa and XIIb1, a full-time and a part-time course respectively leading to the degree of Bachelor of Commerce.

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>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1</td>
</tr>
<tr>
<td>lec. lab./tut.</td>
</tr>
</tbody>
</table>

| 10.91 Mathematics I (by special arrangement more advanced Mathematics may be substituted) | 3 — 0 | 3 — 0 | 3 — 0 |
| 12.01 Psychology I | 2 — 1 | 2 — 1 | 3 — 0 |
| G13 English | 2 — 0 | 2 — 0 | 2 — 0 |

7 — 1 7 — 1 8 — 0

**SECOND YEAR.**
(34 weeks part-time 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>

| General Biology (by special arrangement Physics I or advanced Mathematics may be substituted) | 2 — 4 | 2 — 4 | 2 — 4 |
| 12.02 Psychology II | 2 — 2 | 2 — 2 | 2 — 2 |
| G23 History | 2 — 0 | 2 — 0 | 2 — 0 |

6 — 6 6 — 6 6 — 6
### THIRD YEAR

*(34 weeks part-time course.)*

<table>
<thead>
<tr>
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<td></td>
<td>Industry</td>
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### FOURTH YEAR

*(34 weeks part-time course.)*

#### Industrial Course Elective

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<td></td>
<td>Industrial and Labour Relations</td>
<td>3 - 0</td>
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#### Counselling Course Elective

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<td>3 - 0</td>
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<td>12.70</td>
<td>Psychology IVb (Principles of Counselling)</td>
<td>2 - 2</td>
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<td>12.11A</td>
<td>Psychological Assessment IIa (Counselling)</td>
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## FIFTH YEAR

(34 weeks part-time course.)

### Industrial Course Elective

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<td>lec. lab./tut.</td>
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<td>lec. lab./tut.</td>
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<td>12.21 Psychology V (Applied Social)</td>
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<td>12.40 Personnel Techniques (including Field Work)</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
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<td>12.50 Research Seminar</td>
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<tr>
<td>12.40a Psychology Vb (Counselling Techniques including Field Work)</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
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<td>12.43 Professional Relations</td>
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<td>1 — 0</td>
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<td>12.44 Occupational Information</td>
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<td>12.50 Research Seminar</td>
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### Counselling Course Elective

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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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<td>2 — 4</td>
<td>2 — 4</td>
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<td>1 — 0</td>
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<td>12.44 Occupational Information</td>
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## SIXTH YEAR (HONOURS)

(34 weeks part-time course.)

### Industrial or Counselling

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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>12.31 Psychology VI—Current Issues in Applied Psychology</td>
<td>3 — 0</td>
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<td>12.60 History of Psychology</td>
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<td>12.51 Research Seminar</td>
<td>1 — 0</td>
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**Note:** The above table details the course electives for the Fifth and Sixth Years of study, including the number of hours per week for lectures, laboratory, and tutorials across Terms 1, 2, and 3.
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 page 211.

First 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>loc. tut.</td>
<td>loc. tut.</td>
<td>loc. tut.</td>
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<td>2 - 0</td>
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<td>14.11 Accounting I</td>
<td>2 - 2</td>
<td>2 - 2</td>
<td>2 - 2</td>
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<tr>
<td>15.11 Descriptive Economics</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>15.12 Economics I</td>
<td>1 1/2 - 1/2</td>
<td>1 1/2 - 1/2</td>
<td>1 1/2 - 1/2</td>
</tr>
<tr>
<td>G13 English</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
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<tr>
<td>or History</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>1 1/2 - 3/4</td>
<td>1 1/2 - 3/4</td>
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| Total                 | 10 1/2 - 2 3/4 | 10 1/2 - 2 3/4 | 10 1/2 - 2 3/4 |
SECOND YEAR.

(34 weeks day course.)

<table>
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<tr>
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<td>$\frac{1}{2}$</td>
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<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
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<tr>
<td>15.21 Statistical Method I</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
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<tr>
<td>Special Subject I</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
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<tr>
<td>Special Subject II</td>
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<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
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</table>

*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).
- 14.42B Law.
- 14.52 Business Finance.
- 14.52A Production.
- 14.52B Marketing.
- Science.
- Humanities Elective.

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>
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<td>1</td>
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<tr>
<td>15.15 Economics IV</td>
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<td>$\frac{1}{2}$</td>
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<tr>
<td>15.22 Statistical Method II</td>
<td>1</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Seminar in Economic Problems</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<tr>
<td>Special Subject III</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
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<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
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<tr>
<td>Seminar in Specialisation</td>
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<td>1</td>
<td>0</td>
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<tr>
<td>G30.2 Scientific Method</td>
<td>1</td>
<td>0</td>
<td>1</td>
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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>
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<tr>
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<td>1½ — ½</td>
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## THIRD YEAR

(34 weeks day course.)

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<td></td>
<td>1½ — ½</td>
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* The two Elective subjects will be chosen from those listed on page 210, with the exception of 14.52 Business Finance. Students may not take both 14.53A Production and 14.53B Marketing.

## FOURTH YEAR

(34 weeks day course.)

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
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<th>Term 2</th>
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<td>1½ — ½</td>
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<td>0 — 1</td>
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<td>1½ — ½</td>
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<td>0 — 1</td>
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<td>0 — 1</td>
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<tr>
<td>G30.2 Scientific Method</td>
<td>1 — 0</td>
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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 213 and 214.

**FIRST YEAR.**

*(34 weeks part-time course.)*

<table>
<thead>
<tr>
<th>Subject</th>
<th>Term 1.</th>
<th>Term 2.</th>
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<tr>
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<tr>
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<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>15.11 Descriptive Economics</td>
<td>2</td>
<td>0</td>
<td>2</td>
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<tr>
<td>G13 English</td>
<td>2</td>
<td>0</td>
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<tr>
<td>G23 History</td>
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<tr>
<td>G30.1 Logic</td>
<td>7</td>
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**SECOND YEAR.**

*(34 weeks part-time course.)*

<table>
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<tr>
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<tr>
<td>15.12 Economics I</td>
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</tr>
<tr>
<td>15.21 Statistical Method I</td>
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**THIRD YEAR.**

*(34 weeks part-time course.)*

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<tr>
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<tr>
<td>15.22 Statistical Method II</td>
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<td>1</td>
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* Students will choose one subject from the list of Electives set out on page 210.
### Fourth Year

*(34 weeks part-time course.)*

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### Fifth Year

*(34 weeks part-time course.)*

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### 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.)*

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* See footnote to Fourth Year.
FOURTH YEAR.
(34 weeks part-time course.)

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7 - 1 7 - 1 7 - 1

* Students will choose two Elective subjects from those listed on page 210, with the exception of 14.52 Business Finance.

FIFTH YEAR.
(34 weeks part-time course.)

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6½ - 1½ 6½ - 1½ 6½ - 1½

SIXTH YEAR.
(34 weeks part-time course).

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4½ - 3½ 4½ - 3½ 4½ - 3½
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 and 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 and Metallurgy 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 courses.

<table>
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| Course                          | 1.11  | 2.21  | 2.41  | 5.101 | 5.211 | 10.11 | 10.11B | 11.10 | 13.12  | 13.20  | 13.33  | 15.13  | 15.23  | 15.33  | 17.13  | 17.23  | 17.33  | 17.43  | 17.53  | 17.63  |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Physics                        | 3     | 3     | 3     | 3     | 0     | 4     | 4     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Chemical Techniques            | 0     | 3     | 0     | 3     | 0     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| General Chemistry              | 3     | 3     | 3     | 3     | 4     | 3     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| Engineering Drawing and Materials | 2    | 2     | 3     | 3     | 0     | 4     | 4     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Workshop Processes and Practice | 0    | 0     | 3     | 3     | 0     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| Mathematics                    | 0     | 3     | 3     | 3     | 4     | 3     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| Mathematics                    | 0     | 3     | 3     | 3     | 4     | 3     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| English                        | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| History                        | 1     | 1     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |

| Total                          | 15    | 11    | 14    | 14    | 10    | 17    |       |       |       |       |       |       |       |       |       |       |       |       |

* Tutorial.

Textile Chemistry.

**SECOND YEAR.**

*(34 weeks day course.)*

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| Total                          | 13    | 11    | 12    | 11    | 14    | 13    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

**THIRD YEAR.**

*(34 weeks day course.)*

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| Course                          | 2.33  | 2.63  | 15.13 | 15.23 | 15.33 | 17.13 | 17.23 | 17.33 | 17.43 | 17.53 | 17.63 | 17.73 | 17.83 | 17.93 | 17.10 | 17.11 | 17.12 | 17.13 | 17.14 | 17.15 | 17.16 |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Physical Chemistry             | 1     | 2     | 1     | 2     | 1     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| Organic Chemistry              | 1     | 2     | 1     | 2     | 1     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| Textile Technology II          | 7     | 8     | 7     | 8     | 7     | 8     | 7     | 8     | 7     | 8     | 7     | 8     | 7     | 8     | 7     | 8     | 7     | 8     | 7     | 8     |
| Textile Science I              | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     |
| Textile Engineering I          | 1     | 0     | 1     | 0     | 1     | 0     | 1     | 0     | 1     | 0     | 1     | 0     | 1     | 0     | 1     | 0     | 1     | 0     | 1     | 0     |
| Biochemistry                   | 1     | 2     | 1     | 2     | 1     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| Social Science Elective        | 2     | 0     | 2     | 0     | 2     | 0     | 2     | 0     | 2     | 0     | 2     | 0     | 2     | 0     | 2     | 0     | 2     | 0     | 2     | 0     |

| Total                          | 16    | 14    | 16    | 14    | 14    | 16    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

* Social Science Elective.

COU:SE XIII—TEXTILE TECHNOLOGY.
**Textile Physics.**

**SECOND YEAR.**

*(34 weeks day course.)*

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* Tutorial.

**THIRD YEAR.**

*(34 weeks day course.)*

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**Textile Engineering.**

**SECOND YEAR.**

*(34 weeks day course.)*

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* Tutorial.  
** Starts in sixth week of first term.
## Third Year

(34 weeks day course.)

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* Tutorial.

### Textile Manufacture

## Second Year

(34 weeks day course.)

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* Tutorial.

## Third Year

(34 weeks day course.)

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FOURTH YEAR.
(24 weeks day course.)
Common to all courses.
Second and third terms only—Long vacation and first term
in industry.

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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 Method 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 222.
### FIRST YEAR.

(34 weeks day course.)

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### SECOND YEAR.

(34 weeks day course.)

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<td>Law I</td>
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<td>1 - 0</td>
<td>1 - 0</td>
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*Note.*—A 5,000 word thesis is to be prepared during second year.

### THIRD YEAR.

(34 weeks day course.)

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**Total:**

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<th>Term 3</th>
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<tr>
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*Elective Subjects.*

Students will choose as their Elective Subject one of the following:

- 12.92 Psychology II (Com.) Science I
- 14.53A Production Geography I (if available)
- 14.53B Marketing Humanities Elective
- 15.15 Economics IV.
Honours.

Candidates for Honours will complete the first year of the Pass syllabus and undertake the following programme in second, third and four years.

Second Year.
(34 weeks day course.)

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<td>1 — 0</td>
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<td>14.33 Taxation</td>
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*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.)

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<td></td>
<td>10½ — 3½</td>
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Note.—A 5,000 word thesis is to be prepared during third year.

Fourth Year.
(34 weeks day course.)

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<td>1½ — ½</td>
<td>1½ — ½</td>
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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 224 and 225.

**First Year.**
(34 weeks part-time course).

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<td>2 — 0</td>
</tr>
<tr>
<td>or G23 History</td>
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**Second Year.**
(34 weeks part-time course).

<table>
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<td>1½ — ¾</td>
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**Third Year.**
(34 weeks part-time course).

<table>
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<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
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<td>14.43b</td>
<td>2 — 0</td>
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<td>2 — 0</td>
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<tr>
<td>15.13</td>
<td>1½ — ¾</td>
<td>1½ — ¾</td>
<td>1½ — ¾</td>
</tr>
<tr>
<td></td>
<td>6½ — 2½</td>
<td>6½ — 2½</td>
<td>6½ — 2½</td>
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</tbody>
</table>
FOURTH YEAR.
(34 weeks part-time course).

<table>
<thead>
<tr>
<th>Courses</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>12.91 Psychology I (Com.)</td>
<td>2—0</td>
<td>2—0</td>
<td>2—0</td>
</tr>
<tr>
<td>14.14 Accounting IV</td>
<td>2—1</td>
<td>2—1</td>
<td>2—1</td>
</tr>
<tr>
<td>14.33 Taxation</td>
<td>2—0</td>
<td>2—0</td>
<td>2—0</td>
</tr>
<tr>
<td>15.14 Economics III</td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td></td>
<td>7½—1½</td>
<td>7½—1½</td>
<td>7½—1½</td>
</tr>
</tbody>
</table>

Note.—A 5,000 word thesis is to be prepared during fourth year.

FIFTH YEAR.
(34 weeks part-time course).

<table>
<thead>
<tr>
<th>Courses</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>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>14.15 Accounting Control</td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
<tr>
<td>14.23 Auditing</td>
<td>2—0</td>
<td>2—0</td>
<td>2—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>15.22 Statistical Method II</td>
<td>1—0</td>
<td>1—0</td>
<td>1—0</td>
</tr>
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<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>
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<tr>
<td></td>
<td>9—0</td>
<td>9—0</td>
<td>9—0</td>
</tr>
</tbody>
</table>

* The list of Elective subjects is set out on page 221.

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>
<thead>
<tr>
<th>Courses</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>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>14.14 Accounting IV</td>
<td>2—1</td>
<td>2—1</td>
<td>2—1</td>
</tr>
<tr>
<td>14.23 Auditing</td>
<td>2—0</td>
<td>2—0</td>
<td>2—0</td>
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<tr>
<td>14.33 Taxation</td>
<td>2—0</td>
<td>2—0</td>
<td>2—0</td>
</tr>
<tr>
<td>15.14 Economics III</td>
<td>1½—½</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td></td>
<td>7½—1½</td>
<td>7½—1½</td>
<td>7½—1½</td>
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### Fifth Year
(34 weeks part-time course)

<table>
<thead>
<tr>
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<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>12.91 Psychology I (Com.)</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>14.15 Accounting Control</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>14.53A Production</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>or 14.53B Marketing</td>
<td></td>
<td></td>
<td></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 Method II</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1½ — 0</td>
</tr>
</tbody>
</table>

**Note.**—A 5,000 word thesis is to be prepared during fifth year.

### Sixth Year
(34 weeks part-time course)

<table>
<thead>
<tr>
<th>Course</th>
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<th>Term 3</th>
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<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</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>
<tr>
<td>14.52 Business Finance</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</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>
</tbody>
</table>

**Note.**—Honours candidates will choose their Elective subject from the list printed on page 221, with the exceptions of 15.15 Economics IV, and 14.53A Production or 14.53B Marketing (whichever subject was taken in fifth 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>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>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 Method I</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>G13 English</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>or G23 History</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G30.1 Logic</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
</tbody>
</table>

**Note.**—A 5,000 word thesis is to be prepared during fifth year.

*5112—8 K5137*
SECOND YEAR.
(34 weeks part-time course).

<table>
<thead>
<tr>
<th></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>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>

* 6 — 1 6 — 1 6 — 1

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 I
  Humanities Elective

Note.—A 5,000 word thesis is to be prepared during second year.
SCHOOL OF ECONOMICS.

The School of Economics offers full-time and part-time courses which allow for specialisation in Economics or Statistics 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 either Economics or Statistics 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.

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 of Technology. 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.

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 statisticians 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 mathematics and gives an intensive training in the logical bases of advanced statistical analysis. In developing this statistical training considerable 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 statistical analysis and to attend a seminar in statistical problems. By these means students are given a thorough training not only in the theory of advanced statistical methods but in their application to the types of problem encountered in the public service, industry and commerce.

The general pattern of the course is the same for both specialisations. All students take courses in Philosophy, Psychology and English or History, as well as the more specifically commercial subjects of Economics and Accounting. There are also two courses in Statistical Method which form part of all Commerce courses.

The special Economics or Statistics 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.

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 pages 230 and 231.

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>
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<tbody>
<tr>
<td>12.91</td>
<td>2</td>
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<td>2</td>
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<tr>
<td>14.11</td>
<td>2 - 2</td>
<td>2 - 2</td>
<td>2 - 2</td>
</tr>
<tr>
<td>15.11</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>15.12</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
<td>1½ - ½</td>
</tr>
<tr>
<td>G13</td>
<td>2 - 0</td>
<td>2 - 0</td>
<td>2 - 0</td>
</tr>
<tr>
<td>G23</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
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</table>

Total: 10½ - 2½ weeks
### SECOND YEAR
(34 weeks day course.)

<table>
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<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>15.13 Economics II</td>
<td>$1\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
</tr>
<tr>
<td>15.14 Economics III</td>
<td>$1\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
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<tr>
<td>15.21 Statistical Method I</td>
<td>$1\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
</tr>
<tr>
<td>Special Subject I†</td>
<td>$1\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
</tr>
<tr>
<td>Special Subject II†</td>
<td>$1\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$9\frac{1}{2}$</td>
<td>$2\frac{1}{2}$</td>
<td>$9\frac{1}{2}$</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.).
- 14.42 Law.
- 14.52 Business Finance.
- 14.53A Production.
- 14.53B Marketing.
  - Science I.
  - Humanities Elective.
- 12.93 Psychology II (Education) (for intending teachers).

**Note.** A 5,000 word thesis is to be prepared during second year.

### 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>
<tbody>
<tr>
<td></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
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<tr>
<td>14.15 Accounting Control</td>
<td>1</td>
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<td>1</td>
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<tr>
<td>15.22 Statistical Method II</td>
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<td>1</td>
</tr>
<tr>
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<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Special Subject III</td>
<td>$1\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
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<tr>
<td>Special Subject IV</td>
<td>$1\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
<td>$1\frac{1}{2}$</td>
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<tr>
<td>Seminar in Specialisation</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<tr>
<td>G30.2 Scientific Method</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>$7\frac{1}{2}$</td>
<td>$3\frac{1}{2}$</td>
<td>$7\frac{1}{2}$</td>
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</tbody>
</table>
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>Hours per week.</th>
<th>Term 1.</th>
<th>Term 2.</th>
<th>Term 3.</th>
</tr>
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<tbody>
<tr>
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<td>lec.</td>
</tr>
<tr>
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<td>1 — 0</td>
<td></td>
<td>1 — 0</td>
</tr>
<tr>
<td>14.52</td>
<td>2 — 0</td>
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<td>2 — 0</td>
</tr>
<tr>
<td>15.13</td>
<td>1½ — ½</td>
<td></td>
<td>1½ — ½</td>
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<tr>
<td>15.21</td>
<td>1½ — ½</td>
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<td>1½ — ½</td>
</tr>
<tr>
<td>Special Subject I†</td>
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<td>1½ — ½</td>
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<tr>
<td>Elective Subject*</td>
<td>2 — 0</td>
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<td>2 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9½ — 1½</strong></td>
<td><strong>9½ — 1½</strong></td>
<td><strong>9½ — 1½</strong></td>
</tr>
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</table>

### 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.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>14.15</td>
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<td></td>
<td>1 — 0</td>
</tr>
<tr>
<td>14.43</td>
<td>1 — 0</td>
<td></td>
<td>1 — 0</td>
</tr>
<tr>
<td>15.14</td>
<td>1½ — ½</td>
<td></td>
<td>1½ — ½</td>
</tr>
<tr>
<td>15.22</td>
<td>1 — 0</td>
<td></td>
<td>1 — 0</td>
</tr>
<tr>
<td>Special Subject II†</td>
<td>1½ — ½</td>
<td></td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Special Subject III</td>
<td>1½ — ½</td>
<td></td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Elective Subject*</td>
<td>2 — 0</td>
<td></td>
<td>2 — 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9½ — 1½</strong></td>
<td><strong>9½ — 1½</strong></td>
<td><strong>9½ — 1½</strong></td>
</tr>
</tbody>
</table>

† 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 229, with the exception of 14.52 Business Finance. Students may not take both 14.53A Production and 14.53B Marketing.

NOTE.—A 5,000 word thesis is to be prepared during third year.
FOURTH 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.</td>
<td>tut.</td>
<td>lec.</td>
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<tr>
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<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.53B Marketing ....................</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.15 Economics IV ...................</td>
<td>1½—½</td>
<td>1½—½</td>
</tr>
<tr>
<td>Seminar in Economic Problems ...</td>
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<td>2 — 1</td>
</tr>
<tr>
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<td>0 — 1</td>
</tr>
<tr>
<td>G30.2 Scientific Method ............</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 — 4</td>
<td>8 — 4</td>
</tr>
</tbody>
</table>

COURSE XVb1—COMMERCe (ECONOMICS).

AND

COURSE XVb2—COMMERCe (STATISTICS).

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 233 and 234.

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.</td>
<td>tut.</td>
<td>lec.</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></td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G23 History ..........................</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G30.1 Logic ..........................</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></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.</td>
<td>tut.</td>
<td>lec.</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 Method I ..........</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>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 — 1</td>
<td>6 — 1</td>
</tr>
</tbody>
</table>
### 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></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>14.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounting Control</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>15.13</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>Economics II</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15.22</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>Statistical Method II</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>
<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 229.

### 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></td>
<td>lec.</td>
<td>tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>15.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>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>

† Economics students who intend to enter the teaching profession may take Geography I and II (if available).

**NOTE.**—A 5,000 word thesis is to be prepared during fourth year.

### 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>15.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>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>Seminar in Special Subject</td>
<td>0 — 1</td>
<td>0 — 1</td>
<td>0 — 1</td>
</tr>
<tr>
<td></td>
<td>3 — 3</td>
<td>3 — 3</td>
<td>3 — 3</td>
</tr>
</tbody>
</table>
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.</th>
<th>Term 2.</th>
<th>Term 3.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
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<tr>
<td>14.15</td>
<td>Accounting Control</td>
<td>1 — 0</td>
<td>1 — 0</td>
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<tr>
<td>14.43</td>
<td>Law II</td>
<td>1 — 0</td>
<td>1 — 0</td>
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<tr>
<td>15.13</td>
<td>Economics II</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td>15.22</td>
<td>Statistical Method II</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td></td>
<td>Elective Subject*</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6¼ — ½</td>
<td>6¼ — ½</td>
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</tbody>
</table>

**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>
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</thead>
<tbody>
<tr>
<td></td>
<td>lec. tut.</td>
<td>lec. tut.</td>
<td>lec. tut.</td>
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<tr>
<td>14.53A</td>
<td>Production</td>
<td>2 — 0</td>
<td>2 — 0</td>
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<tr>
<td>14.53B</td>
<td>Marketing</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>15.14</td>
<td>Economics</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td></td>
<td>Special Subject I†</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td></td>
<td>Elective Subject*</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 — 1</td>
<td>7 — 1</td>
</tr>
</tbody>
</table>

* Students will choose two Elective subjects from those listed on page 229, with the exception of 14.52 Business Finance.

**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>
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<td>lec. tut.</td>
<td>lec. tut.</td>
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<tr>
<td>14.52</td>
<td>Business Finance</td>
<td>2 — 0</td>
<td>2 — 0</td>
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<tr>
<td>15.15</td>
<td>Economics IV</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td></td>
<td>Special Subject II†</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
</tr>
<tr>
<td></td>
<td>Special Subject III</td>
<td>1½ — ½</td>
<td>1½ — ½</td>
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<tr>
<td></td>
<td></td>
<td>6½ — 1½</td>
<td>6½ — 1½</td>
</tr>
</tbody>
</table>

† Economics students who intend to enter the teaching profession may take Geography and II (if available).

Note.—A 5,000 word thesis is to be prepared during fifth year.
### 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. 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>
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<td>1½ — ½</td>
<td>1½ — ½</td>
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<tr>
<td>Special Subject V</td>
<td>2 — 1</td>
<td>2 — 1</td>
<td>2 — 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>
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<tr>
<td><strong>Total</strong></td>
<td><strong>4½ — 3½</strong></td>
<td><strong>4½ — 3½</strong></td>
<td><strong>4½ — 3½</strong></td>
</tr>
</tbody>
</table>
SCHOOL OF HOSPITAL ADMINISTRATION.

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 XVI A, 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 110 and 111.

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>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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<tbody>
<tr>
<td>16.1</td>
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<td>3</td>
<td>3</td>
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<td>16.2</td>
<td>Administrative Aspects of Medicine</td>
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<td>1½</td>
<td>1½</td>
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<tr>
<td>16.3</td>
<td>Fundamentals of Medical Science</td>
<td>1½</td>
<td>0</td>
<td>0</td>
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<tr>
<td>16.4</td>
<td>Fundamental Operations of the Hospital</td>
<td>5</td>
<td>5</td>
<td>0</td>
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<tr>
<td>16.5</td>
<td>Principles of Hospital Administration</td>
<td>2½</td>
<td>2½</td>
<td>0</td>
</tr>
<tr>
<td>16.6</td>
<td>Hospital Organisation</td>
<td>2½</td>
<td>2½</td>
<td>0</td>
</tr>
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<td>16.7</td>
<td>Advanced Hospital Administration</td>
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<td>5</td>
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<td>16.8</td>
<td>Biostatistics</td>
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<td>3</td>
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<td>Psychology Seminar</td>
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<td>3</td>
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<td>14.11b</td>
<td>Accounting Seminar</td>
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<td>14.15b</td>
<td>Accounting Control</td>
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<td>0</td>
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<tr>
<td>15.111</td>
<td>Economics Seminar</td>
<td>1</td>
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<table>
<thead>
<tr>
<th>Total</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>24½</td>
<td>24½</td>
<td>24½</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 XVI—EXTENSION COURSE IN HOSPITAL ADMINISTRATION.

The full-time extension course of one academic year 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 fulfill 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.

34 Weeks' Day Course.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1 Term 2 Term 3</td>
<td></td>
</tr>
<tr>
<td>16.2 Administrative Aspects of Medicine</td>
<td>0 1½ 1½</td>
</tr>
<tr>
<td>16.3 Fundamentals of Medical Science</td>
<td>1½ 0 0</td>
</tr>
<tr>
<td>16.4 Fundamental Operations of the Hospital</td>
<td>8* 8* 8*</td>
</tr>
<tr>
<td>16.5 Principles of Hospital Administration</td>
<td>2½ 2½ 0</td>
</tr>
<tr>
<td>16.6 Hospital Organisation</td>
<td>2½ 2½ 0</td>
</tr>
<tr>
<td>16.9 Hospital Statistics and Records</td>
<td>0 0 1½</td>
</tr>
<tr>
<td>12.94 Psychology Seminar</td>
<td>3 3 3</td>
</tr>
<tr>
<td>14.11b Accounting Control</td>
<td>0 0 3</td>
</tr>
<tr>
<td>15.111 Economics Seminar</td>
<td>2 2 2</td>
</tr>
<tr>
<td></td>
<td>19½ 19½ 19</td>
</tr>
</tbody>
</table>

* Three hours per week will be spent in practical work at hospitals, clinics, etc.
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.

There also exists a need in the community for improved part-time facilities for general training in biological science to degree level without specialisation for the needs of industry. The School offers major sequences in botany and zoology in the Science courses (see pages 130 to 136) to meet this end. Further, graduates in other sciences and in engineering require on occasion to extend the scope of their professional training to include the biological sciences. A short course in biology is available for this purpose.

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>lec. lab./tut.</th>
<th>lec. lab./tut.</th>
<th>lec. lab./tut.</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>2.21 Chemical Techniques</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part I</td>
<td>2 — 1*</td>
<td>2 — 1*</td>
<td>2 — 1*</td>
</tr>
<tr>
<td>10.11B Mathematics, Part I</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>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>1½ — 1½</td>
<td>1½ — 1½</td>
<td>1½ — 1½</td>
</tr>
<tr>
<td>2.41 General Chemistry, Part II</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>17.21 General Biology</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
</tbody>
</table>

| 17.31 Botany | 4½ — 8 |
| 17.71 Zoology | 4½ — 8 |

Students majoring in Entomology must take 17.31 Botany and 17.71 Zoology as electives.

**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>2.32p Physical Chemistry</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>Plus TWO electives from—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.52 Quantitative Analysis</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>2.42 Inorganic Chemistry</td>
<td>1 — 2½</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>17.31 Botany</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.71 Zoology</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
</tbody>
</table>

| 2.32p Physical Chemistry | 4 — 6½ — 7½ |
| 2.62 Organic Chemistry | 4 — 7—9½ |
| Plus TWO electives from— | 4 — 4½—7 |

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>Course Code</th>
<th>Course Name</th>
<th>Term 1.</th>
<th>Term 2.</th>
<th>Term 3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.13</td>
<td>Biochemistry</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td></td>
<td>Plus THREE electives from</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.33</td>
<td>Physical Chemistry</td>
<td>1 — 2</td>
<td>1 — 2\frac{1}{2}</td>
<td>1 — 2\frac{1}{2}</td>
</tr>
<tr>
<td>2.63</td>
<td>Organic Chemistry</td>
<td>1 — 2\frac{1}{2}</td>
<td>1 — 2</td>
<td>1 — 2\frac{1}{2}</td>
</tr>
<tr>
<td>2.63A</td>
<td>Organic Chemistry (or)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.23</td>
<td>Experimental Biology</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.41</td>
<td>Entomology I</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.51</td>
<td>Microbiology</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
</tbody>
</table>

| Total       |                             | 4 — 8\frac{1}{2} | 4 — 8\frac{1}{2} | 4 — 8 |

Elective subjects must be chosen with due regard for pre-requisites. Students majoring in Entomology must include Experimental Biology as an elective.

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>17.14</td>
<td>Biochemistry</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
<tr>
<td>17.42</td>
<td>Entomology II, and</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
<tr>
<td>17.43</td>
<td>Entomology III</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
<tr>
<td>17.52</td>
<td>Microbiology and</td>
<td>2 — 4</td>
<td>2 — 4</td>
<td>2 — 4</td>
</tr>
<tr>
<td>17.53</td>
<td>Microbiology</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total       |                             | 4 — 8  | 4 — 8  | 4 — 8  |

EITHER—any two major sequences from—

OR—one major sequence (from above) plus two electives from—

<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>2.34D</td>
<td>Physical Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>2.64D</td>
<td>Organic Chemistry</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>2.65B</td>
<td>Chemistry and Analysis of Food</td>
<td>1 — 3</td>
<td>1 — 3</td>
<td>1 — 3</td>
</tr>
<tr>
<td>17.42</td>
<td>Entomology II</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.52</td>
<td>Microbiology</td>
<td>1 — 2</td>
<td>1 — 2</td>
<td>1 — 2</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>Course Code</th>
<th>Course Name</th>
<th>Term 1.</th>
<th>Term 2.</th>
<th>Term 3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G13</td>
<td>English or G23 History</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G30.1</td>
<td>Logic</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</td>
</tr>
<tr>
<td>G43</td>
<td>Economics or G63 Psychology</td>
<td>2 — 0</td>
<td>2 — 0</td>
<td>2 — 0</td>
</tr>
<tr>
<td>G50.1</td>
<td>Government</td>
<td>1 — 0</td>
<td>1 — 0</td>
<td>1 — 0</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</td>
</tr>
<tr>
<td>Advanced formal instruction in the field of study</td>
</tr>
<tr>
<td>Research project</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

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 is required to be submitted.

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 the course is designed primarily to broaden the scientific background of students, the needs of secondary school science teachers have been taken into account, and it is hoped that the course will contribute 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 for 34 weeks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>lec. lab./tut.</td>
</tr>
</tbody>
</table>

| 17.13 Biochemistry            | 1 — 2 |
| 17.21 General Biology        | 2 — 4 |
| **Total**                     | 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>Course Code</th>
<th>Course Name</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.23</td>
<td>Experimental Biology</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.31</td>
<td>Botany</td>
<td>1 — 2½</td>
</tr>
<tr>
<td>17.41</td>
<td>Entomology I</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.51</td>
<td>Microbiology</td>
<td>1 — 2</td>
</tr>
<tr>
<td>17.71</td>
<td>Zoology</td>
<td>1 — 2½</td>
</tr>
</tbody>
</table>

3 — 6½—7
DEPARTMENT OF PRODUCTION ENGINEERING.

The Department of Production Engineering offers a full-time course in Industrial Engineering leading to the degree of Bachelor of Engineering. This course is designed for persons with engineering ability whose interests lie in the planning, developing and control of manufacturing operations.

The first two years of the 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 emphasised 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 course require full-time 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.
<table>
<thead>
<tr>
<th>COURSE XVIII—INDUSTRIAL ENGINEERING.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIRST YEAR.</strong></td>
</tr>
<tr>
<td>(24 weeks day course.)</td>
</tr>
<tr>
<td><strong>Hours per week.</strong></td>
</tr>
<tr>
<td>Term 1.</td>
</tr>
<tr>
<td>Term 2.</td>
</tr>
<tr>
<td>lec. lab./tut. lec. lab./tut.</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>1.41 Physics</td>
</tr>
<tr>
<td>2.111 Chemistry</td>
</tr>
<tr>
<td>5.11 Engineering Drawing</td>
</tr>
<tr>
<td>5.21 Mechanical Technology</td>
</tr>
<tr>
<td>5.41 Descriptive Geometry</td>
</tr>
<tr>
<td>8.11 Engineering Mechanics</td>
</tr>
<tr>
<td>10.11 Mathematics</td>
</tr>
<tr>
<td>G10 English</td>
</tr>
<tr>
<td>3  —  3</td>
</tr>
<tr>
<td>3  —  3</td>
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<tr>
<td>0  —  3*</td>
</tr>
<tr>
<td>2  —  0</td>
</tr>
<tr>
<td>1  —  1*</td>
</tr>
<tr>
<td>4  —  2*</td>
</tr>
<tr>
<td>2  —  0</td>
</tr>
<tr>
<td>24—14</td>
</tr>
<tr>
<td>24—14</td>
</tr>
<tr>
<td><strong>Tutorial.</strong></td>
</tr>
<tr>
<td><strong>SECOND YEAR.</strong></td>
</tr>
<tr>
<td>(24 weeks day course.)</td>
</tr>
<tr>
<td><strong>Hours per week.</strong></td>
</tr>
<tr>
<td>Term 1.</td>
</tr>
<tr>
<td>Term 2.</td>
</tr>
<tr>
<td>lec. lab./tut. lec. lab./tut.</td>
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<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>1.42 Physics</td>
</tr>
<tr>
<td>4.912 Materials Technology</td>
</tr>
<tr>
<td>5.32 Engineering Mechanics</td>
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<tr>
<td>5.52 Fluid Mechanics</td>
</tr>
<tr>
<td>5.72 Thermodynamics</td>
</tr>
<tr>
<td>8.112 Theory of Structures</td>
</tr>
<tr>
<td>8.92 Properties of Materials</td>
</tr>
<tr>
<td>10.12 Mathematics</td>
</tr>
<tr>
<td>18.12 Industrial Administration</td>
</tr>
<tr>
<td>G20 History</td>
</tr>
<tr>
<td>2  —  11*</td>
</tr>
<tr>
<td>11  —  1*</td>
</tr>
<tr>
<td>1  —  1*</td>
</tr>
<tr>
<td>1  —  1*</td>
</tr>
<tr>
<td>1  —  1*</td>
</tr>
<tr>
<td>1  —  1*</td>
</tr>
<tr>
<td>0  —  0</td>
</tr>
<tr>
<td>2  —  0</td>
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<td>1  —  2</td>
</tr>
<tr>
<td>18—12</td>
</tr>
<tr>
<td>16—12</td>
</tr>
<tr>
<td><strong>Tutorial.</strong></td>
</tr>
<tr>
<td><strong>THIRD YEAR.</strong></td>
</tr>
<tr>
<td>(24 weeks day course.)</td>
</tr>
<tr>
<td><strong>Hours per week.</strong></td>
</tr>
<tr>
<td>Term 1.</td>
</tr>
<tr>
<td>Term 2.</td>
</tr>
<tr>
<td>lec. lab./tut. lec. lab./tut.</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>5.12 Mechanical Engineering Design</td>
</tr>
<tr>
<td>5.33 Theory of Machines</td>
</tr>
<tr>
<td>6.83 Electrical Engineering</td>
</tr>
<tr>
<td>10.53 Statistics</td>
</tr>
<tr>
<td>18.23 Production Control</td>
</tr>
<tr>
<td>18.33 Methods Engineering</td>
</tr>
<tr>
<td>18.53 Design for Production I (Processes-Materials)</td>
</tr>
<tr>
<td>G30 Philosophy</td>
</tr>
<tr>
<td>G63 Psychology</td>
</tr>
<tr>
<td>0  —  3*</td>
</tr>
<tr>
<td>1  —  1*</td>
</tr>
<tr>
<td>1  —  1*</td>
</tr>
<tr>
<td>2  —  1</td>
</tr>
<tr>
<td>2  —  0</td>
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<td>3  —  2</td>
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</tr>
<tr>
<td>15—14</td>
</tr>
<tr>
<td>15—14</td>
</tr>
<tr>
<td><strong>Tutorial.</strong></td>
</tr>
</tbody>
</table>
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.</td>
<td>lab./tut.</td>
<td>lec.</td>
</tr>
<tr>
<td>14.11A Accounting</td>
<td>3</td>
<td>2*</td>
<td>3</td>
</tr>
<tr>
<td>14.15A Accounting Control</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>15.114 Economics</td>
<td>1</td>
<td>1*</td>
<td>1</td>
</tr>
<tr>
<td>18.44 Personnel Administration</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>18.54 Design for Production II</td>
<td>2</td>
<td>2*</td>
<td>2</td>
</tr>
<tr>
<td>(Interchangeable Manufacture)</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>18.64 Industrial and Commercial Law</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>18.94 Marketing</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Thesis and Project</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Advanced Elective (Humanities or</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Social Science)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16</td>
<td>13</td>
<td>16</td>
</tr>
</tbody>
</table>

* Tutorial.
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, and Government. 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 402 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></td>
<td>Term 1. Term 2. Term 3.</td>
</tr>
<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>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>
(ii) *Applied Chemistry; Chemical Engineering; Food Technology; Metallurgy; Wool Technology; Textile Technology.*

<table>
<thead>
<tr>
<th>Year</th>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G10</td>
<td>English</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>G20</td>
<td>History</td>
<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td><strong>Second Year</strong></td>
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</tr>
<tr>
<td>G30</td>
<td>Philosophy*</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Third Year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Science Elective</td>
<td></td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Fourth Year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Elective</td>
<td></td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</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>Year</th>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G10</td>
<td>English</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>G20</td>
<td>History</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G30</td>
<td>Philosophy</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td></td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Third Year</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Fourth Year</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Advanced Elective</td>
<td></td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

(iv) *Architecture.*

<table>
<thead>
<tr>
<th>Year</th>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G10</td>
<td>English</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>G20</td>
<td>History</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Third Year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fourth Year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Science Elective</td>
<td></td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Fifth Year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G70</td>
<td>Painting, Sculpture and Allied Arts</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
(v) **Science.**

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIRST YEAR.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G10 English</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>G20 History</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>SECOND YEAR.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>THIRD YEAR.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Elective</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

(vi) **Commerce (Accountancy, Economics, Statistics, Applied Psychology).**

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIRST YEAR.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<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><strong>A SUBSEQUENT YEAR.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<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.

**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>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FINAL YEAR.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<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</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>

(ii) **Engineering (Mechanical, Electrical Civil); Applied Geology*; Surveying.**

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SECOND YEAR.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G10 English</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>FOURTH YEAR.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G20 History</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>SIXTH YEAR.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G30 Philosophy</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>SEVENTH YEAR.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>2</td>
<td>1</td>
<td>1</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>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>
</tbody>
</table>

**Second Year.**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G23 History</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Third Year.**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G33 Philosophy</td>
<td>2</td>
<td>2</td>
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</tbody>
</table>

(iv) **Science.**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G10 English</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Second Year.**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G20 History</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Third 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 Philosophy</td>
<td>0</td>
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</tbody>
</table>

**Fourth Year.**

<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>Social Science Elective</td>
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**Fifth Year.**

<table>
<thead>
<tr>
<th>Course</th>
<th>Term 1</th>
<th>Term 2</th>
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</thead>
<tbody>
<tr>
<td>Advanced Elective</td>
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<td>2</td>
</tr>
</tbody>
</table>

(v) **Commerce (Accountancy, Economics, Statistics, Applied Psychology).**

<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>
</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.
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 three:

<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>
</tbody>
</table>

The two courses may be taken concurrently or in different years.

**Humanities Elective Subjects.**

The full range of elective subjects is:

- G41 Economics
- G51 Government
- G61 Psychology
- G12 English
- G22 History
- G32 Philosophy
- G42 Economics
- G52 Government
- G62 Psychology

2.—DEPARTMENT OF ARTS, NEWCASTLE.

Arts courses leading to the degree of Bachelor of Arts of the University of New England are offered at Newcastle University College. The courses are given by the Department of Arts of the Faculty of Humanities and Social Sciences, in conjunction with the University of New England.

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 1957 the following courses preparatory to a degree in Arts will be offered at Newcastle.

GROUP I.

Language and Literature.

English.
French.
German.
Latin.
Greek.

Elementary courses in German and in Greek may also be offered if suitably qualified students are forthcoming. These courses only count as "qualifying courses" for degrees if in each case they form the first of a sequence of three.

GROUP II.

Historical, Mental and Social Sciences.

History.
Philosophy.
Psychology.
Economics.
Education.

GROUP III.

Mathematics.
Geography.

To qualify for a degree, courses must be chosen from at least two of the three groups and the nine courses selected by a Pass candidate must include:

(i) A sequence of three courses in each of three subjects; or
(ii) a sequence of three courses in each of two subjects, a sequence of two courses in a third subject and one single course; or
(iii) a sequence of three courses in one subject and a sequence of two courses in each of three others.

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, Mathematics and Geography.

The by-laws regarding graduation in Arts, whether at Pass or Honours level, are determined by the University of New England, and any changes or final decisions in matters of interpretation are the prerogative of the New England authorities.

The Annual Examinations (both Pass and Honours) are held in Newcastle during November and December each year. Notice of intention to sit must be given on the prescribed form and accompanied by the examination fee of £3 during the month of June.
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 comprising 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 various courses 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.

<table>
<thead>
<tr>
<th>Subject Designation</th>
<th>Comprises sections—</th>
<th>Appears in Course(s)</th>
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</thead>
<tbody>
<tr>
<td>1.11</td>
<td>ABCF</td>
<td>I, II, III, IIIA, IV, XIII</td>
</tr>
<tr>
<td>1.11 Part I</td>
<td>A</td>
<td>IIb1, IIb3, IIb4, IIIb1,</td>
</tr>
<tr>
<td>1.11 Part II</td>
<td>BCF</td>
<td>IIIb2, IIIb3, IVb.</td>
</tr>
<tr>
<td>1.12</td>
<td>DEGH</td>
<td>I, XIII*</td>
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<tr>
<td>1.12A</td>
<td>CDEFF</td>
<td>VI.</td>
</tr>
<tr>
<td>1.13</td>
<td>I</td>
<td>I, XIII*</td>
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<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,</td>
</tr>
<tr>
<td>1.42</td>
<td>DEF</td>
<td>VIIIb, X VIII.</td>
</tr>
<tr>
<td>1.41d</td>
<td>A</td>
<td>VB, VIB, VIIb, VIIIb,</td>
</tr>
<tr>
<td>1.42d</td>
<td>BDEF</td>
<td>VIIIb1.</td>
</tr>
<tr>
<td>1.43d</td>
<td>CP1H</td>
<td>VB, Vc, VB, Vic2, VIIb,</td>
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<tr>
<td></td>
<td></td>
<td>VIIb, VIIib, VIIIc.</td>
</tr>
<tr>
<td>1.91</td>
<td>N</td>
<td>IX, XI.</td>
</tr>
<tr>
<td>1.92</td>
<td>DEG</td>
<td>IIb1, III, IIIb1, IIIb2, IV, IVb, IVc1,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XIII†.</td>
</tr>
</tbody>
</table>

Physics I (Science)  ABCF  IIS.
Physics I Part I A  IIS.
Physics I Part II BCF  IIS.
Physics II (Science) DEGHK  IISb.
Physics II Part I DEGH  IIS.
Physics II Part II K  IIS.
Physics III (Science) LM  IISb.
Physics III Part I L  IIS.
Physics III Part II M  IISb.

* For students in Textile Physics.
† For students in Textile Engineering.
SECTION A.

Mechanics.


Light


Heat


Electricity and magnetism.


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.


Positive rays. Packing fraction.
Properties of \( \alpha, \beta \) and \( \gamma \) radiations.
Radioactivity and radioactive transformations.
The neutron and positron.
Induced radioactivity.
Fission, fusion. Cosmic rays.

SECTION F1.

Compton effect. Heisenberg uncertainty principle and matter waves.

One-dimensional Schrödinger wave equation and its application to electrons in square well.
Pauli exclusion principle and the periodic table.
Electrical conductors, insulators and semi-conductors. Transistors.
Crystal structure and dislocation theory.
SECTION G.

Electronics.


SECTION H.

Thermodynamics and physics of gases.


SECTION I.

Electric circuit theory and electrical measurements.


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.


SECTION J.

Subdivisions marked (E) are electives of which the student will take two only.

Instrumentation and techniques.

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) Electronic devices (one term).
   Precision electrical measurements (one term).
   General mechanics (one term).
(ii) Atomic, nuclear and solid-state physics.

* 5112—9 K 5137
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) Solid-state physics and advanced thermodynamics.
(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.
Physical factors involved 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.
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 2 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 electrophysiology 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.
CHEMISTRY.

Subjects 2.00 to 2.73; 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.


2.21 Chemical Techniques.

The course is intended to prepare all students entering the Chemistry Department for the work that lies ahead. Safety and laboratory rules, the handling of reagent bottles and the technique common to most branches of chemistry will be introduced and demonstrated. The student will carry out a series of experiments in order to obtain practice in the techniques illustrated.

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 Waals 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.
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 IIA, IIIA, 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 Cs, Cl, 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, Te 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.

Modern valency theory. Elementary wave mechanics. Hydrogen molecule. Covalent bond, valence bond and molecular orbital approach. Hybridisation, multiple and fractional bond orders. Factors affecting bond strength. Overlap integral, electro negativity resonance, etc. Nature of the metal-ligand bond in complex compounds. Physical methods and the structure of complex compounds. A survey of modern methods and of experimental results. Nuclear chemistry: a survey of fundamentals and recent developments. Special topics such as electron deficient compounds, reaction mechanisms in inorganic chemistry, recent chemistry of the hydrides, organo-metal chemistry will be treated as time permits. An essay on some topic in advanced inorganic chemistry will be required.
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.

A more advanced treatment of topics selected from the following:—Modern theories of acids; bases and indicators; chromatography and ion exchange; separation of elements by solvent extraction; modern developments in electrolysis, polarography and coulometry; spectrometry.

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 hydro-carbons, cyclo-alkanes, alcohols, alkyl halides, ethers, carbonyl compounds, acids, esters, amides, amines and nitro compounds. An introduction to stereochemistry, carbohydrates, proteins, fats and oils.

2.63 AND 2.63A ORGANIC CHEMISTRY.

A more detailed study following on 2.62 Organic Chemistry, with emphasis on aromatic chemistry. The aromatic hydrocarbons, aromatic substitution; halogenation, nitration, sulphonation. The anil halides, nitro compounds and sulphonic acids and derivatives. Phenols, aromatic alcohols, amines and other reduction products of aromatic nitro compounds. Diaz reaction and coupling. Aromatic carbonyl compounds, including quinones. Dyestuffs, colour and dyeing. The aromatic acids and derivatives. An introduction to heterocyclic compounds, polymerisation and high polymers (including natural polymers).

In 2.63A special emphasis is placed on carbohydrates, fats and other materials of biological interest.

2.64, 2.64A AND 2.64D ORGANIC CHEMISTRY.

An advanced treatment of specialised topics in organic chemistry. Reaction mechanisms, 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 and statistical methods. 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.

2.73 *Mathematical Chemistry.*

*Partial Differential Quantities.*—Typical partial differential functions encountered in statistics and chemical thermodynamics.


**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.

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 II A (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.

**3.44 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.
3.54 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.

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.

3.65 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.
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—
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 lectures occupying one hour per week for one year. This course gives a general survey of the whole field of metallurgy and is intended to emphasise the relationship existing between the various branches of the subject and the subsidiary 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, thermochemistry and thermophysics, heat balances, fuels and combustion, fluid flow, heat transfer, refractories, physical and chemical attributes of the solid and liquid phases in metallurgical systems, mass action, reaction rates. Quantitative application to metallurgical engineering problems.

Laboratory work designed to illustrate the above principles will be performed.

4.23 Metallurgical Engineering II.

The unit processes used in extracting metals from ores and other raw materials. Gas solid processes (roasting, calcining and drying), sintering, reduction of metal oxides, smelting, converting, distillation and refining processes studied from the standpoint of the principles introduced in 4.22 Metallurgical Engineering I. Apparatus, design and operation variables and engineering calculations for the important unit processes. Hydrometallurgical and electrometallurgical processes. Laboratory experiments designed to measure important variables in typical metallurgical processes and to illustrate the principles of process equipment on a small scale will be performed.

4.24 Metallurgical Engineering III.

Integrated metallurgical engineering processes. Synthesis of the principles, unit operations and unit processes studied in preceding courses, with emphasis on the development of complete flowsheets for producing metals from ores. Economic and other considerations involved in choice of process. Production metallurgy of iron and steel and of the important non-ferrous metals.
4.32 PHYSICAL METALLURGY I.

The nature of alloys; phase equilibria 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, cast irons and the light alloys of aluminium, magnesium and titanium.


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.

A study of the principal alloy steels, cast irons and miscellaneous ferrous alloys, in continuation of the work commenced in 4.32 Physical Metallurgy I; the alloys of aluminium and magnesium; miscellaneous alloys of importance for magnetic, high temperature, etc., properties.

A closer study of the effects of stress and deformation in producing controlled properties, preferred orientation, etc., and in alleviating unwanted effects produced by the limitations of the casting process. (Suitable industrial operations will be chosen for study and lectures, laboratory work and visits to a local industry will be co-ordinated for this purpose). A brief survey of modern theories on the physics of metals and alloys and of advanced methods of investigation.

Laboratory work will include microscopical and physical investigations of more complex alloy systems and projects based upon the metallurgical aspects of the industrial operations studied.
4.34 PHYSICAL METALLURGY III.

Modern theories of the metallic state studied in more detail than in 4.33 Physical Metallurgy II, but with constant attention to illustrations drawn from contemporary industrial metallurgical practice. Advanced study of ternary and complex equilibria in metals, slags, refractories, etc., and the effects of out-of-equilibrium conditions upon such systems.

Crystallography and crystal analysis; stereographic projection, pole figures, etc., and their use in investigations.

Laboratory work will include use of advanced methods of physical investigation.

4.44 AND 4.44A INDUSTRIAL METALLURGY.

A choice of several topics from the following (not necessarily complete) list will be available to enable students to gain a more intimate knowledge of particular industrial specialities in the various centres. Where possible, lectures will be given by industrial experts in the various fields—

1. Industrial Relations.
2. Industrial Organisation.
3. Metalliferous Mining.
7. Founding.
8. Metal Forming.
9. Welding and Joining.
10. Metal Finishing.
15. Quality Control.

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.
4.912 AND 4.912D MATERIALS TECHNOLOGY.

For engineering students who do not expect to practice metallurgy as a profession.


Laboratory.

MECHANICAL ENGINEERING.
Subjects 5.00 to 5.74.

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 machine elements with due consideration to acceleration effects. Design of reciprocating mechanisms.

Students will work in groups of two or three in the drawing office on one of the following assignments:—

Air Compressor.
Internal Combustion Engine.
Steam Engine.

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.

   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.

C. **Flywheels for reciprocating machines.**

D. **Engine governors.**
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.
   1. One degree of freedom, vibration measuring instruments, vibration isolation.
   2. Two degrees of freedom, undamped vibration absorbers.
   3. Critical speeds of shafts.
   4. Torsional vibration of shafts.
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 of 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.


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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; 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.

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; \(T = \Phi\) 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 A.S.E. 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. Use of steam tables; determination of dryness fraction; entropy of water-steam; \( T - \Psi \) diagram for water-steam.

Steam Boilers.

Purpose; classification; examples and application of water-tube and fire-tube boilers; essential fittings.

Boiler Auxiliaries.

Economizer; air pre-heater; draft 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 dry steam on \( T - \Psi \) 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; work done on blading; 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.

Laboratory.

Engine Testing and Performance.

5.73 AND 5.73D THERMODYNAMICS.
I.C. Engines—General.
Review of air standard cycles and efficiencies. Effect of compression ratio and maximum permissible pressure on A.S.E. Effects of dissociation and variable specific heat. Calculation of cycle temperatures and efficiencies; use of Hottel charts.

I.C. Engines—Gas and Petrol Engines.
Two and four stroke cycles; ignition; governing; process of combustion; detonation. Effects of ignition timing; valve timing; mixture strength (fuel consumption loops).

I.C. Engines.
Supercharging; high compression ratio; carburettors. Various efficiencies; performance curves; heat accounts.

I.C. Engine—Oil Engine.
Hot bulb type; semi-Diesel; two and four stroke Diesels; air blast and solid injection; governing; process of combustion; effect of mixture strength and compression ratio.

Heat Transfer.
Mean temperature difference for counter-flow and parallel-flow heat exchangers. Mean temperature difference for evaporators; condensers; thermal resistance and overall co-efficient of heat transfer.

Boiler Auxiliaries.
Economizers; superheaters; air preheaters; combustion equipment.
Boiler Performance.
Heat losses; heat accounts; equivalent evaporation; thermal efficiency.

Steam.
Entropy of water-steam; T—\(\varphi\) and P-V diagrams for water-steam; adiabatic equation. Expansions of a vapour; Mollier diagram for water-steam.

Steam Cycles.
Carnot cycle; Clapeyron’s equation; Rankine cycle of operations. Rankine efficiency for wet, dry and S/H steam; feed pump term. Ideal regenerative cycle; use of regenerative methods with compound reciprocators and steam turbines.

Steam Nozzles.
Purpose; types; steam flow through nozzles; critical pressure; determination of steam velocity and weight of discharge. Determination of nozzle dimensions; effects of friction and super-saturation.

Steam Turbines.
Principles of operation; reduction of steam velocity; types of turbine. Velocity compounding; pressure compounding; pressure velocity compounding; reaction turbines; combination turbines. Velocity diagrams for single stage only; calculation of tangential force, work and horsepower; stage efficiency.

5.74 AND 5.74D THERMODYNAMICS.
Gas Turbines.
Gas nozzles; development of gas turbines; constant volume and constant pressure cycles; ideal thermal efficiency; conditions for maximum work; ideal thermal efficiency using heat recovery; adiabatic efficiency; polytropic efficiency; effect of turbine and compressor losses on efficiency; methods of improving efficiency.
Actual cycles; burner efficiency; mechanical efficiency; pressure drops in system; description of components; application and performance of gas turbines.

Steam Turbines.
Steam nozzles; types of turbines; methods of compounding; simple velocity diagrams; calculation of tangential force, work and horsepower; stage efficiency; blade friction; re-heat factor; internal efficiency; multi-stage velocity diagrams; drum and blading dimensions; methods of improving efficiency; application and performance of steam turbines.
Steam Power Plant.
Components; plant layout; plant heat balances; evaporators; feed water treatment (briefly).

Refrigeration and Psychrometry.
Principles and definitions; reversed Carnot cycle; cold air machines; vapour compression refrigeration; effects of superheating and under-cooling; conditions for maximum coefficient of performance. Nature and use of total heat—entropy and pressure—total heat diagrams: absorption refrigeration (commercial and domestic). Properties of refrigerants; application, testing of refrigeration plants; heat accounts. Elements of air-conditioning; use of psychrometric charts.

Binary-fluid Cycles.
Methods of extending temperature range in engines—mercury/steam; internal combustion/steam; diphenyl/steam; practical applications and performance.
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.

6.12 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.f.s. 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.
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 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.

Subjects for Graduate Course in Automatic Control.

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 I.

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 and transfer functions.

**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 Analogue 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 UTAC.
The solution of linear equations.
Methods of solving non-linear equations, and equations with varying coefficients.
The electrolytic tank and other miscellaneous techniques.
MINING ENGINEERING AND APPLIED GEOLOGY.
Subjects 7.00 to 7.703 and Geology (Science).

7.001 MINING PROCESSES.
An introductory course on coal mining with reference to methods of working; access to deposits; elementary treatment of mining science, mine atmospheres, gases, dust, lighting.

7.002 COAL MINING.
Methods of Working Coal.
Open-cut methods; 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. Longwall 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.

7.004 ADVANCED MINING TECHNIQUES.
A special series of lectures on the most recent advances in mining methods, and discussions on current mining engineering problems.

7.013 METALLIFEROUS MINING.
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.
Methods of Working.


Practical.
Examination and operation of all mining machinery available.

7.023 Mining Engineering.

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.


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.


7.024 MINING ENGINEERING.

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.

Winding.—Guides—rigid and flexible. Cages, cage-chains, detach-
ing hooks, capels. Headframes, keps. Decking arrangements. Wind-
ing engines, drums, brakes, reversing gear, overwind and slow bank-
ing gear. Koepe and other winding systems. Characteristic winding 

Laboratory.—Electricity in mines; mining machinery.

7.034 AND 7.034D MINERAL DRESSING.

Object, scope and economics of coal preparation and mineral 
dressing.

Size Reduction: jaw, gyratory, cone and roll crushers, Bradford 
breakers, hammer mills, stamps. Grinding, ball mills, rod mills, tube 
mills.

Liberation: theory and effect on concentration procedures.

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 concentra-
tion; flotation and agglomeration; spiral concentrators; magnetic 
separators; electrostatic separators; amalgamation; cyanidation; 
recovery of metal from ores.

Storage: conveyors, weighing; sampling; feeding; thickening; dry-
ing; 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) Size reduction, crushing, grinding and screening.

(c) Separation.

(i) Coal preparation.

(ii) Mineral concentration.
Mine Atmospheres.

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.

Mining Hygiene and Dust Control.

Miners’ diseases; silicosis; pneumoconiosis; nystagmus; sporotrichosis; ankylostomiasis; dermatitis. Compensation and treatment.

Dust formation. Dust prevention:—Boring; cutting; loading; travelling roads; ore bins and chutes; screens. Air cleaning. Dust extraction. Dust measurement, sampling and analysis.

Mine Lighting and Gas Testing.

Brief historical development of safety lamp; principle and construction of wire gauze. Conditions to be fulfilled in efficient safety lamp; types of flame safety lamps; electric hand lamps and cap lamps; M.L. lamps; mains lighting; discharge lighting; aids to illumination.

Lamp fuels; tests on lamp fuels; illuminating power; design and equipment of lamp rooms; safety lamp tests.

Gas detection. Flame safety lamps; special methane detectors.

Practical.

Inspection and use of equipment discussed in lectures.

Subsidence and Strata Control.

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.

**Spontaneous Combustion, Fires and Inundations.**

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.

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.

**Explosions, Rescue and Recovery Work.**

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.

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.

**Laboratory.**

Analysis of dusts. Explosion tests on coal dust and methane. Rescue apparatus.

7.052 MINING ENGINEERING PRACTICE.

general considerations. Some details of principal types of pumps.
Mine lighting. Mine ventilating. General principles concerning the
production and distribution of the air current. Mine atmospheres.
Heat and humidity. Gases—properties and physiological effects.
Gas testing. Dusts and their control. Health and hygiene. Safety—
Rescue and recovery work. Underground organisation. Surface
organisation. Surface installations. Overall control and management.
Surface methods of working metalliferous and coal deposits. Mining
—it's problems and future.

7.054 AND 7.054D ASSAYING.

Fire Assaying.

Chemical Analysis.

Exercises on the analysis of coal, calorific values of gas and fuels,
gas analysis by Orsat.

Standard methods of analysis of metals and ores—carbon in steel,
lead, zinc, chromium in ores.

Use of spectrophotometer, polarograph; chromatography in suitable
applications.

7.064 MINERAL ECONOMICS.

Sampling: Preliminary examination and classification of mineral
deposits. Equipment necessary for sampling. Techniques for samp-
ing, reduction of samples and despatch. Errors in sampling; salt-
ing; reliability. Assay plans. Minable ore limits. Computation for
determinations of ore reserves.

Mine Valuation: Appraisal of ore reserves. Mining costs. Mineral
beneficiation, extractive metallurgy. Smelter schedules. Marketing
of minerals, prices, points of sale, effect of impurities, mineral
resources. Estimation of mine revenue, life, annual and present
value. Inspection of operating or potential mines. Preparation of
mine reports.


Mine Organisation: Company formation, types of companies, com-
pany law, methods of finance, capital, shares, company expansion,
asorption or amalgamations.

Mine accounting, classes of accounts, bookkeeping, mine stores and
store keeping, profit and loss accounts, balance sheet. Annual report.
Equipment costs, general surface arrangements, location of plant,
workshop and surface buildings. Underground equipment organisa-
Mine Management: 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.

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 7.503E) 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 Mineralogy.

Fundamental laws of crystallography, elements of symmetry, crystal system and classes, descriptive mineralogy and the mode of deposition of the more important economic minerals.

7.512 Mineralogy and Crystallography.


Introduction to the atomic structure of crystals with 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; the index and Fresnel ellipsoids. 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 incident and reflected 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.
7.513 Advanced Mineralogy.

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 investigation of crystalline materials.

Selected chapters of descriptive mineralogy (radio-active minerals, rare-metal minerals, clay minerals, etc.).

The principles of determinative mineralogy; introduction to qualitative microchemical analysis of minerals, including spot tests of minerals and ores.

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; differential thermal analysis of minerals.


The geological evolution of the Australian Continent from the Pre-Cambrian to the Recent times and other important world localities.

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.

7.533 (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. Metallogenetic 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.

7.542 Geophysics.

An introduction to the underlying principle, methods and applications of geophysical prospecting, viz., gravity, magnetic, electrical, seismic, radioactive and miscellaneous. Various physical properties of rocks with particular reference to stress-strain concepts, mechanics of deformation and rupture in rocks, behaviour of rock types under differing stress conditions.

Description and analyses of folds, cleavage, joints, faults, salt domes and slump structures.

7.553 Geology of Fuels.

Coal: Nature and origin, stratigraphic considerations. Coal seam structures—splits, washouts, rolls, rock dykes, igneous intrusions.
Coal seam dislocation—concealed coalfield.
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 petraliferous sediments. Visits to oil refineries.
Micropetrology of coal. Analyses of coal.
Determination of trace elements in coals.

7.564 Photogrammetry and Photogeology.
Study of aerial photographic surveying and the theory of photogrammetry. Use and principle of stereographic mapping instruments.
Application of photogrammetry in determination of geological structures.

7.574 Engineering Geology.
Geological exploratory work in engineering projects; inter-relation of soil mechanics and geology; testing of the physical properties of rocks.
Geological aspects of quarrying and tunnelling, geology of dam sites and reservoirs, bridge and building foundations; rock creep and landslides; protection of river banks against scour; transportation of sediments, siltation of rivers; soil erosion and its control.
Building stones, concrete aggregates, road materials and railway ballast.

7.602 Geology.
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.
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 and gnomic 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, with 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 type 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. Crystal goniometry; stereographic projection of crystals.

Optical Mineralogy: Examination of minerals by means of the polarising microscope in incident of 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, including simple physical, optical, chemical methods, study of the paragenesis and mode of occurrence of common mineral groups. Study of principal rock types in which they occur. Blowpipe analysis of minerals.

7.633 GEOLOGY.

Forms 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.

7.644 Geophysics and Geotectonics.
This subject follows on from 7.542 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, and mining tectonics.

7.673 Geology.

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.
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.

**Part II.**

7.512 Mineralogy and Crystallography.

GEOLOGY II (SCIENCE).

This course of approximately 136 lectures and associated practical work 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 170 lectures and associated practical work are as follows (divided into Part I and Part II in the part-time course):

7.524 Palaeontology.—Systematic classification of the various phyla and detailed study of the various subdivisions of the phyla. Species and intraspecific categories; phylogeny and ontogeny, evolutionary trends and the theories of evolution. Palaeontological environments and their relations to sedimentology; ecology. Statistical methods in palaeontology.

*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.
7.542 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.

8.122 and 8.122D 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.
3.22 Materials of Construction.

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 8 hours of lectures and 20 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.

Steel.—Brief summary of manufacture, testing, selection, and tolerances of structural grades.

Aluminium.—Brief summary of manufacture, properties and use of structural aluminium and aluminium alloys.

Building Stone and Structural Clay Products.—Production, types, application to engineering construction.

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; prismoidal 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.

More advanced treatment of topics introduced in 5.52 Fluid Mechanics, dimensional analysis and theory of models, surface and form resistance, open channel flow, unsteady flow in pipes, hydraulic machinery.
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.

Elements of meteorology and climatology, analysis of precipitation for engineering purposes, soil physics, the run-off process, interception, infiltration, evapotranspiration, estimations of future floods, long-term yield of surface streams, application of hydrologic principles to civil engineering projects with special reference to Australian conditions.

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, practical assignments in taking out quantities and preparing estimates. Costing systems, cost statements, economics of projects, sinking funds, capitalised cost, depreciation.
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.


8.84 Town and Country Planning.


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.

8.92c 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.

8.92m Properties of Materials.

A course for students in Chemical Engineering or 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 from the chosen "Option".

Option 1. Civil Engineering Design.

(a) 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.
(b) *Soil Mechanics and Foundation Engineering*.
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.

(c) *Hydrology*.
Further studies of a selection of topics such as catchment characteristics, infiltration, sediment transportation by streams, river flow and flood routing. Flood flow estimation, long term water-supply yield.

(d) *Hydraulics*.
Further work in hydrodynamics; the theory and practical applications of hydraulic models; sediment transportation; miscellaneous advanced topics as time permits.

(e) *Advanced Mathematics*.
Students whose interests are along the lines of advanced mathematics may study application of such work to specialised engineering problems.

(f) *Modern Foreign Language*.
Students with a leaning towards modern foreign languages may elect to master a language and review recent engineering literature of the country concerned.

**OPTION 2. CIVIL ENGINEERING CONSTRUCTION AND ADMINISTRATION.**
This option is for the student intending to work mainly upon construction work, local government work, and in similar spheres where general supervision of a field organisation is an important factor. Appropriate subjects are:

(a) *Construction Equipment and Methods*.
Analysis of construction procedure and selection and use of equipment for various tasks. Cost estimating, job planning, production capacity, operating costs for different equipment, scheduling of materials and methods applicable to specific kinds of construction.

(b) *Geology*.
An introduction to crystallography, the use of X-ray diffraction, petrological microscope and differential thermal methods for identification of materials.

A short course on the distribution of materials of construction in New South Wales. An introduction to the elasto-plastic properties of rocks. Geophysical techniques as applied to civil engineering.

Practical work to include more advanced mapping problems, megascopic examination of crystal models, micropetrological examination of rock materials, the use of X-ray diffraction and differential thermal methods, the use of geophysical apparatus.

(c) Management.


(d) Road Engineering.

Fundamental principles of road engineering. Detailed study of design and construction practice for various types of traffic and other conditions. Maintenance techniques.

(e) Public Health Engineering.

Review of fundamentals of public health engineering—followed by relatively detailed and comprehensive study of the application of such principles to design, construction and operation of water supply and sewerage system, treatment work, etc., with special reference to modern developments. Review of associated work such as refuse disposal, industrial hygiene, etc.


(a) Astronomy and Geodesy.

Fundamentals of geodesy and astronomy and a study of the application of these sciences to national projects.

(b) Topographical and Aerial Surveying and Photogrammetry.

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.

(c) Soil Mechanics.

See section (b) of Civil Engineering Design Option.
(d) Hydrology.  
See Section (c) of Civil Engineering Design Option.

(e) Hydraulics.  
See Section (d) of Civil Engineering Design Option.

(f) Geology.  
See Section (b) of Civil Engineering Construction Option.

OPTION 4. MATERIALS.

(a) Soil Mechanics.  
See Section (b) of Civil Engineering Design Option.

(b) Concrete Technology.  
Further studies in basis behaviour of concrete materials. Intro-ductory 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.

(c) Advanced Mechanics of Materials.  

(d) Photoelasticity and 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.

(e) Advanced Mathematics.  
To be arranged to suit advanced study of materials behaviour.

(f) Modern Foreign Language.  
See Section (f) of Civil Engineering Design Option.
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 of areas, curves, roads and road intersections; offset areas.

8.423 Survey Computations.

More advanced problems dealing with areas, curves, etc.

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).
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.

8.453 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.

8.463 Mathematics for Surveyors.

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.
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.
WOOL TECHNOLOGY.
Subjects 9.00 to 9.94.

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.


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 types. 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.
Classification and naming of plants.
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 and hormone-type herbicides. Some useful points of weeds.

Principles of crop rotation. Rotations suitable for tablelands and Western areas. Ley farming.

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.

(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.

9.42 General Textiles (Yarns).


At the end of this course the student must present a series of plain and fancy yarns which he has prepared to exemplify the subject matter of the lectures.
9.43 General Textiles (Fabrics).


In this course students must produce a range of hand or power woven fabrics, the construction of which should be based upon the principles of fabric structure discussed during the term. It is most important that the textile student should note changes in the dimensions of these fabrics' weaving state to finishing. Data recorded in this way is of inestimable value in later years as there is no way of making precise calculations of grey particulars from the finished fabrics.

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, slips and scoured wools; wastes and shippers' lines; oddments such as overgrown, dead, black, etc.

9.74 Fibre Science.


9.94 Genetics.

MATHEMATICS.

Subjects 10.00 to 10.92.*

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) and Course IV (Metallurgy).

* For Mathematics and Statistics (Science) subjects see pages 352 and 353.
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.

A course for students in Applied Physics.

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.

10.23 Mathematics.

10.33 Mathematics.

10.43 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.
Variates and univariate distribution functions (binomial, Poisson, normal, t, \( \chi^2 \), \( F \), etc.) and applications, largely to hydrological questions.

10.51 Mathematics.
A course for students in Architecture.
Revision and elementary mathematics needed in costing. Revision of algebraic processes.
Plane and solid geometry. Conic sections. Trigonometry.
Co-ordinate geometry: location of points by co-ordinate systems, plane and solid; graphs in Cartesian co-ordinates.
Calculus: differentiation, integration.
Centroids and moments of inertia.

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 dynamics 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 \( t, \chi^2, F \), 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.
Introduction to probability. Random variables and standard distributions, including the sampling distributions of \( \chi^2, t \) and \( F \).
Estimation.
Tests of statistical hypotheses.

10.91 Mathematics.
A course in mathematics preparing students for work in statistics.
Rectangular Cartesian and polar co-ordinate systems, with applications.
Functions of several variables: partial derivatives.

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.
Mathematics (Science).

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.
(Three one-hour lectures and two tutorial hours per week for three terms.)

Calculus.
Differential equations (and elementary Fourier analysis).
Co-ordinate geometry (and elementary vector analysis).
Dynamics.
Statics.
Infinite series.
Elementary complex functions.

10.2II Higher Mathematics II.
(Seven one-hour lectures per week for three terms.)

Analysis.
Dynamics.
Differential equations.
Vectors.
Algebra.
Geometry.

10.3 Mathematics III.
(Five one-hour lectures per week for three terms.)

Algebra.
Vector analysis.
Differential geometry.
Foundations of geometry.
Differential equations—special functions.
Functions of a complex variable.
Statistics.
Numerical analysis.
Hydrodynamics.
Cartesian tensors.
10.3H Higher Mathematics III.
(Ten one-hour lectures per week for three terms.)
A selection of topics from:
Analysis.
Matrices, and group theory.
Differential and algebraic geometry.
Partial differential equations.
Advanced vector analysis.
Tensor analysis.
Variational calculus.
Mathematical statistics.
Generalised dynamics.
Dynamics of a continuous medium.
Potential theory.
Numerical mathematics.

Theory of Statistics I.
Probability (elementary set algebra).
Variates (univariates, multivariates, expectations, moment generating and characteristic functions).
Standard distributions.
Sampling distributions.
Point estimation (moments, maximum likelihood, minimum $\chi$ 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.

*5112—12 K 5137*
ARCHITECTURE.
Subjects 11.00 to 11.96.


The whole range of this subject has been divided into five sections. The first four sections (subjects 11.101, 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 of Construction).

11.101 Theory of Structures I.

The first-year series of lectures in Theory of Structures is designed to give a thorough grounding in the principles used in calculations relating to architectural construction and covers the following:—

Statics.—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 resolution methods.

Beams.—Moment determination of reactions for simply supported beams (up to and including two supports and two overhanging ends).

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.

Modulus of elasticity.

Summation of elementary beam theory.
**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 columnplates, stool connections, cap and base plates, splices.

Steel Roof Trusses. Types of trusses, types 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 detail 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.


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.

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).

During the first term the student is required to work as a member of a group. Each group is assigned a particular building of architectural merit and historical significance, and must carry out a complete investigation of the building and furnish a report including photographs, drawings and evidence of thorough research of historical background.

During the second and third terms each student is required to study some special department of planning, relative to modern design. Considerable freedom is allowed, but the student must provide evidence of his own studies and reading. One or two advanced exercises in individual research may be given relative to the projects being undertaken in architectural design and construction. Moreover, in addition to this each student has to prepare a dissertation which he will read before the general body of students, answer questions relative to it from his audience of fellow students and take part in general discussion upon it.
11.125—11.126 PROFESSIONAL PRACTICE.

Contracts; relationship of builder, client and architect; professional ethics as laid down by the Royal Australian Institute of Architects; services and fees; office administration; building law and regulations; aspects and problems of practice; business principles; building finance and supervision; relations with the quantity surveyor, structural engineer and other specialists.

11.135 SPECIFICATIONS.

The definition of a specification; the purpose for which it is written; its legal importance and relationship to the building contract; authorship, essentials in writing, composition and style.

Types of specifications in writing, composition and style.

Types of specifications, method of writing, heading and subheadings, the use of indices; explanation of provisional amounts and P.C. items; the use of schedules and abstracts.

Preamble to a specification; special conditions, requirements of local authorities; the trade clauses.

In the third term a practical example of specification writing is studied and the use of the standard specification explained.

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 the equipment and engineering services of buildings, and specialised planning and equipment of buildings, such as hospitals, schools, etc. Some of this advanced study will 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; this work will be embodied in a thesis to be submitted by the student; importance is attached to the general presentation of this thesis.

A limited number of informal lectures is given by the Professor of Town and Country Planning of the University of Sydney covering the principles and problems of civic architecture. 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.

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 Sydney, Wollongong, Newcastle, etc., 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.

Introductory course of lectures, arranged by the Department of Town and Country Planning, University of Sydney. There is one term of studio work associated with the lectures. The course of lectures is preparatory to the post-graduate diploma course in Town Planning, conducted jointly by the University of Sydney and the New South Wales University of Technology. This introductory course of lectures provides a brief outline of what is comprised within town and country planning, and touches on the history of town planning, the theory and practice of town planning, and draws attention to the social, economic, geographic and architectural factors involved.
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 rooms; 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.

11.21-11.22 FREEHAND DRAWING AND PRESENTATION.

Freehand drawing provides an extension of the experience of mechanical draughtsmanship. The course is designed to aid facile expression of ideas and to develop in the student an awareness of the harmony of the principles of linear construction with visual aspects of form.

Practical work in various media is intended to develop a correlation between hand and eye, and a gradually increasing skill in depictive power.

The course is designed to develop in the student an appreciation of the formal values underlying pictorial structure, and a skill in using the media with which he will be concerned. To ensure this, practical exercises are designed to provide experience in varied media and the student is required to treat a given perspective as the subject of composition within a limited range of tonal values and colours.

It is required that 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.

Students are required to keep a sketch book as a supplementary project.

11.21 FREEHAND DRAWING AND PRESENTATION I.

Subjects include—Selection and care of equipment, principles of linear perspective, general drawing, object drawing, quick sketching, memory drawing, outdoor sketching and studies, rendering in various media and techniques, and presentation.

11.22 FREEHAND DRAWING AND PRESENTATION 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.

Introduction; methods employed for estimating; standard mode of measurement; profit, establishment and other changes; plant—purchase and hiring costs; awards, insurances, taxes, etc.; local and other authorities—scale of fees and charges; provisional and prime cost items.

Trades and Operations. Examples of "building up" the elements of unit cost rates in respect to: Excavation, drainage, concrete, formwork, reinforcement, brickwork, masonry, structural steel and ironwork, carpentry and joinery, plumbing, floor and wall tiling, paving, plastering, painting and decorating, glazing.

The subject-matter for each trade or operation will include:

(a) Current material prices.
(b) Schedule of unit labour costs.
(c) Memoranda in respect—weights, mixing proportions and yield of materials; waste allowance; working costs and depreciation of plant; scaffolding, etc.
(d) Problems for students to work out, using class examples for reference.

Variations.

(a) Measuring and valuing.
(b) Methods of adjusting.

Schedules.

(a) Grouping of unit items to obtain a bulked cost rate for different structural parts of buildings.
(b) Comparison of costs for alternative methods of construction related to structural parts of a building.

11.32 ARCHITECTURAL STUDIES AND DESIGN.

A course in visual design, leading to Architectural Design and Construction. The objectives of this study are a development of aesthetic perception in the student and an awareness of his relation to his environment. By process of inquiry and critical analysis each student is encouraged to make individual assessment of visual design fundamentals.

Concept—The Nature of "Design"; an approach to the problem of creative thinking and design.

Design—Elements of visual design and principles of composition; three dimensional design exercises.
Colour—Theories of colour mixing; the C.I.E., Otswold and Munsell Systems of colour notation; the psychology of colour and its relation to purpose; colour schemes.

Texture—The senses involved and study of characteristics of surfaces; relation to purpose; texture “collages” and schemes.

Space Concept—Study of space articulation; the model; analytical purpose problems and integration of previous studies.

11.41-11.43 HISTORY OF ARCHITECTURE.

This is one of the basic subjects leading 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 living 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.

The subject is divided into three stages. Each stage consists of about thirty-three one-hour lectures. A final examination is set at the close of each stage.

11.41 HISTORY OF ARCHITECTURE I.

Primitive construction: The correlation of hands and mind and the beginnings of architecture.

Ancient (1st Term). Works of the Egyptians, Chaldaeans, Assyrians, Babylonians, Persians, Pelasgians and Etruscans.


Classic (3rd Term). Works of the Romans and Roman Empire.
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.

11.52 Building Science.

Heat as a form of energy, its molecular movement and measurement. Ways in which heat affects homogeneous and heterogeneous 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.

Short lectures given by different specialists on the staff, both from the point of view of the employer (the master builder) and the specialist craftsman. The specialist trade instructors in the department provide demonstrations in the techniques of bricklaying, carpentry, joinery, plastering, painting and decorating. Each student is required to do a small amount of practical work, such as mixing mortar, carrying and laying of bricks, elementary practical work in carpentry and joinery, plastering and painting. Model making, in connection with the architectural studies.

The general intention of this period is to familiarise the student with the tools and terms used by the building craftsman, and to give him an understanding of the craftsman’s skill.

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 roof 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 Ordinance.

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.*

11.72 Building Construction II.

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.
11.81 INTRODUCTION TO ARCHITECTURE AND BUILDING.

(a) How a building is produced. Description of the "thirty-three steps" from conception to final completion.

(b) The functions of the architect in society; the functions of related specialists, builders, structural engineers, quantity surveyors, town planners, specialists in services and equipment, the general foreman, craftsman and labourer.

(c) The structure of the building industry—how the architect fits into it; professional and trade organisations in the industry; the manufacture and distribution of building materials.

(d) Brief description of the main subject matter which the student will have to undertake throughout the whole course; how one subject is complementary to another and the practical implications of all the subjects.

(e) Basic principles in architecture and building; the fundamentals in the course of study which the student must watch for.

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.

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.

Factors influencing architectural design: people, climate, topography, materials, economics, social system, etc.; influence of the weather and the "elements", i.e., sun, light, air, wind, rain, etc.; orientation.

Elements of contemporary architecture; floors, walls, roofs, windows, doors, etc.; expression of function, materials and construction; style; character and atmosphere; colour and texture in buildings.

Choice of materials; engineering services and equipment in buildings.

Logical approach to an architectural problem; procedure of planning and design from the broad aspects to the detailed.

Influence of adjacent buildings on design; elementary notes on urban architecture; scale and other principles of design in simple contemporary work; detailing; the surroundings of buildings. Contemporary philosophies.

11.91 Building Science.

This subject deals 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, direction of chemical change, valency formulae and equations.
Properties of metals and non-metals.
Basic chemical compounds, 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, 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. Heat transmission and insulation.
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.

This range of subjects embodies and applies all the subject matter of the other lectures and studies in the Architecture 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, generally accenting fundamental aesthetic and technical points but with problems interspersed expressly to stimulate imaginative thinking.

In all problems construction is 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.
Studio assignments on the analysis of building elements for structure and function, historical survey and consideration of contemporary application in various structural systems, followed by integration development in simple structure. Analysis of module planning, solid and void, plan composition and massing, siting and
sun penetration. Requirements in living, eating and sleeping, followed by inclusive consideration in domestic design (multi-cell type), co-ordinating all structural and functional analysis, furniture and interior design and landscaping, in sketch esquisse, working drawing, specification and rendered presentation.

11.94 ARCHITECTURAL DESIGN AND CONSTRUCTION B.
Problems more intricate in planning and technical aspects; exercises designed to determine the influence on design of climate and the elements; construction and materials; the logical use of glass; natural lighting and aspect; the aesthetic exploitation of such practical needs in modern building; expression of character in building.

In third term, a series of lectures is given on furniture; cabinet-making; the aesthetics of interior finishes, furniture, carpets, curtains and furnishings; colour, materials and techniques in interior decoration.

11.95 ARCHITECTURAL DESIGN AND CONSTRUCTION C.
Lighting, both natural and artificial; design of commercial buildings and the examination of associated economic factors; industrial planning, expression of function in large architectural projects; influence of adjacent buildings or sites on design; housing; group building; simple problems in urban architecture involving the concept of town planning. Where possible problems are set for actual sites.

11.96 ARCHITECTURAL DESIGN AND CONSTRUCTION D.
Large architectural projects, usually done in small groups, 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 12.94.

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, adjustive behaviour, 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.

12.02 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.

12.03 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.

12.10 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 IIa—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, ethnocentricism, 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.
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 and use of different techniques. Directive and non-directive counselling. Theory of group counselling and group therapy. The place of mental health programmes in modern institutions.
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.

12.93 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 Psychology Seminar.

(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.
TEXTILE TECHNOLOGY.

Subjects 13.00 to 13.34.

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.
13.13 TEXTILE TECHNOLOGY II.

(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.

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.

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.
ACCOUNTANCY.

Subjects 14.00 to 14.53.

14.11 ACCOUNTING I.

Two hours lecture and two hours tutorial weekly.

This is an introductory course designed to serve students desiring to specialize in accounting as well as those requiring a basic knowledge of accounting for use in other fields of Commerce.

The course aims to define the purposes and functions of accounting; to show the applications of accounting principles; and how accounting data may be used by management as a basis for decisions.

Topics covered will include the recording process, the preparation of revenue and financial statements, and an introduction to the analysis, interpretation and use of financial statements.

The course will be in three sections, (a) basic theory; (b) application of theory to the accounts of sole owners, partnerships, and corporations; and (c) the comprehension of accounting data and 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.

This course aims to define the purpose and functions of accounting; to show the applications of accounting principles and how accounting data may be used by management. The course is in three sections: (a) basic theory; (b) application of principles; (c) comprehension of accounting data and reports.

14.12 ACCOUNTING II.

Two hours lecture and two hours tutorial weekly.

This is a course in financial accounting and deals especially with accounting records on an historical basis. It covers accounting method as applied to the accounts of sole traders and partnerships, joint ventures, branches, pastoral and rural enterprises, un-systematised (single entry) recording, deceased estates, fire losses and loss of profits insurance, and accounting for commodity stocks.

14.13 ACCOUNTING III.

Two hours lecture and two hours tutorial weekly.

This course covers all aspects of accounting for companies, including company formation, reconstructions, mergers and liquidations; debentures; receiverships; 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; accounts of trustees and bankrupt estates; 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 accounting and includes:


Cost systems: job costing—builders and contractors' costs—process costs—by-products and joint products—standard costs.

Cost analysis: the relation between costs and prices—effect of volume on cost—capacity factors—break-even analysis—profit control charts—differential costs.

Budgets and budgeting: the principles of budgeting—types of budget—preparation of budgets—budgetary installation and budgetary control. Accounting aspects of the Commonwealth and State budgets.


14.15 Accounting Control.

One hour lecture weekly.

This course will be integrated with 15.22 Statistical Method II, and will include the preparation and administration of budgets, the design and maintenance of efficient accounting systems for managerial control; the control of costs or expenses through the use of accounts and standards; stock control, materials and stores control, decisions whether to make or buy; fixed asset control and control of capital investment; internal control; profit planning and control.
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.

14.15B **Accounting Control.**

A course for students of Hospital Administration.

This course will include the preparation and administration of budgets, the design and maintenance of efficient accounting systems for managerial control; the control of costs or expenses through the use of accounts and standards; stock control, materials and stores control, decisions whether to make or buy, costing control, fixed assets control and control of capital investment; internal control; profit planning and control.

14.16 **Advanced Cost Accounting.**

(Pre-requisite—Accounting IV.)

One and a half hours lecture and one and a half hours tutorial weekly.

This course is designed to give an intensive coverage of the principles and applications of cost accounting and budgeting, particularly as they apply to industrial organisations. It includes advanced standard costing, preparation of cost statements and reports, classification and analysis of expenditure, direct or marginal costing, differential costing, profit control and break-even analysis, uniform costing, incentive systems; estimation of costs; developments in cost accounting.

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.

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, ethics of the profession, auditing standards and procedures, audit programmes, investigations, reports, applications of auditing principles in verification of financial statements, internal auditing and control, and trends and developments in the profession.
14.33 **Taxation Law and Practice.**

One lecture of two hours weekly.

A detailed study of the Commonwealth Income Tax and Social Service Contribution Act and the Commonwealth Income Tax and Social Services Contribution Assessment Act, general principles of sales tax legislation, and pay-roll tax.

14.42 **Law I.**

One hour lecture weekly.

Law in society. Sources of the law, the elements of jurisprudence, principles of constitutional law; general principles of the law of contract, sale of goods, and principal and agent; hire purchase, bailments, common carriers, and personal property.

14.43 **Law II.**

One hour lecture weekly.

The law relating to guarantees and securities, negotiable instruments, partnerships, deceased estates, trustees, insurance, landlord and tenant, and commercial arbitration.

14.43B **Law III.**

Two one-hour lectures weekly.

This course will involve a detailed study of the Companies Act (New South Wales), 1936, with special reference to incorporation, management and administration, share capital, borrowing and winding-up. It will also include a study of the Bankruptcy Act, 1924-1928, with particular reference to the Federal Bankruptcy Courts, proceedings in connection with sequestration, administration of property, trustees and discharge of bankrupt.

14.52 **Business Finance.**

One lecture of two hours weekly.

This course is designed to acquaint the student with the fundamentals of financial analysis and planning. Although considerable emphasis is placed on corporation finance, the subject matter is intended to be useful in any type of business enterprise and applicable to financial problems of business regardless of the legal form of organization.

The course will deal with short and long term finance from external sources and financing by retention of earnings. Attention will also be given to problems of obtaining funds for the launching of new enterprises with special reference to the provision of adequate working capital, market consideration, share, debenture and note issue rights, reserve and dividend policies and the influence of prevailing business conditions.
14.53A PRODUCTION.

One lecture of two hours weekly.

This course is designed to familiarize non-technical students with production processes and organizations, works lay-out, production planning and control, incentive schemes and time and motion study. It 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 distribution of the product. It will cover the analysis of these problems; the importance of the consumer in making marketing decisions, market research, channels of distribution, merchandising, sales promotion and price policies, etc.
ECONOMICS.

Subjects 15.00 to 15.22.

15.11 DESCRIPTIVE ECONOMICS.

Two hours per week.

The organisation and operation of the Australian economy. The course will begin by studying the factor endowment of Australia in terms of human resources (labour), mineral and agricultural resources (land) and the results of past economic activity (capital). It will then proceed, via the Australian national income, to consider particular sectors of the economy and the operation of public and private economic institutions. Major attention will be paid to Australia’s dependence on international trade.

15.12 ECONOMICS I.

Two hours per week.

A broad survey of the subject matter of economics. Contents include the economic problem and resource allocation; the national income and the nation income accounts; a sketch of elementary employment theory; money and banking; and an outline of business cycle problems and problems of growth.

15.13 ECONOMICS II.

Two hours per week.

The theories of demand and production. Prices in different market situations. Government policy and its impact on the behaviour of the firm. The social control of industry.

15.14 ECONOMICS III.

Two hours per week.

The savings and investment analysis. Money, interest rates, and prices. The business cycle in its domestic and international aspects. Problems of growth. Problems of full employment. The role of fiscal policy, monetary policy, money wage changes, and exchange manipulation.

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 problem of wage determination. Methods of solution adopted in Australia. The functions and powers of Australian industrial

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.

15.21 STATISTICAL METHOD I.

Two hours per week.


15.22 STATISTICAL METHOD II.

Two hours per week.

Methods of market and marketing research. Quality and quantity control. Application of statistical methods to commercial and industrial problems.
HOSPITAL ADMINISTRATION.

Subjects 16.00 to 16.9.

16.1 SEMINAR IN ADMINISTRATION.

This course will attempt to give an appreciation of the role of the administrator. It will outline the background of administration within the Commonwealth from an historical, political, social and economic point of view. The concepts of administration will be dealt with and consideration given to their usefulness to the functions of the administrator.

16.2 ADMINISTRATIVE ASPECTS OF MEDICINE.

A series of lecture and discussion periods conducted by representatives of the medical staff of the clinical services within a hospital to orientate the non-medical student to the problems peculiar to medical needs and medical practice. It will include a study of the major areas of illness in which hospitals play a public health role.

16.3 FUNDAMENTALS OF MEDICAL SCIENCE.

This course will be for non-medical graduates. A generalized survey of disease entities, injuries and methods of diagnosis and treatment with particular consideration of the aspects of medical science and of public health principles that should be understood by the administrator.

16.4 FUNDAMENTAL OPERATIONS OF THE HOSPITAL.

16.5 PRINCIPLES OF HOSPITAL ADMINISTRATION.

16.6 HOSPITAL ORGANISATION.

The following topics related to hospitals and hospital affairs are dealt with in the three general subjects on Hospital Administration, 16.4 Fundamental Operations of the Hospital, 16.5 Principles of Hospital Administration, and 16.6 Hospital Organisation:

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. Hospital planning, construction and design. Public relations, fund-raising methods, funds and foundations. Rural hospitals and health facilities—regional planning, hospital service. Economics of patient care, health insurance schemes, governmental and voluntary methods, hospital and health facilities overseas, governmental and community agencies for health and welfare services, volunteer and auxiliary service. Public health and the hospital, special hospitals and current trends, insurance aspects of hospital affairs.

16.4 FUNDAMENTAL OPERATIONS OF THE HOSPITAL.

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.

16.5 PRINCIPLES OF HOSPITAL ADMINISTRATION.

The basic concepts of management and their application to hospitals comprise the subject matter to be studied.

Major emphasis will be directed towards the development of an understanding of human relations and the personnel skills required for effective management of hospitals.

16.6 HOSPITAL ORGANISATION.

This course aims to develop the conceptual skills required by the hospital administrator in appreciating the role and function of the hospital in modern society.

The basic philosophy and the purpose of hospital organisation are analysed in lecture and seminar sessions. Particular problems with reference to the governing board, medical staff and other critical areas are thoroughly investigated. Criteria and methods by which evaluation of an organisation may be accomplished are discussed.
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 HOSPITAL RECORDS AND STATISTICS.

This course deals with medical records of hospitals. Consideration will be given to the collection, maintenance and care of records, nomenclature and classification of disease. The collection, interpretation and analysis of hospital statistical data will also be reviewed.
BIOLOGICAL SCIENCES.
Subjects 17.00 to 17.71.

17.11 Biochemistry.
An introduction to the biochemistry of carbohydrates, lipids, amino-acids, proteins and other compounds of biological importance.

17.12 Biochemistry.
An introduction to the following topics:

A brief treatment of physico-chemical phenomena of biological importance, including the properties of the colloidal state.

The nature of enzymes and their mode of action, the classification of enzymes and the more important enzymic systems.

An introduction to the metabolism of carbohydrates, lipids and proteins.

17.13 Biochemistry.
An introduction to the following topics:

Amino acids, peptides, proteins. Their chemical and physical properties, structure, classification and biological significance. Special attention is paid to the colloidal properties of proteins.

The general properties of enzymes and the nature of the catalytic process. Specificity, activators, inhibitors, coenzymes, prosthetic groups.

Hydrolases, phosphorylases, oxidases, dehydrogenases, adding, transferring and isomerising enzymes.

Alcoholic fermentation and the glycolytic sequence. The tricarboxylic acid cycle.

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 biochemistry of the cell-wall and of reserve materials.

3. Nucleic acids, nucleoproteins, virus multiplication, protein synthesis, immunological phenomena.

4. Biological oxidations.
5. The production, storage, transport and utilisation of energy in biological systems.
6. An introduction to comparative biochemistry.
7. The biochemistry of micro-organisms; technological aspects of large-scale cultivation; the principle fermentation industries; enzyme technology.

Practical work to illustrate the above topics.

17.21 General Biology.


Practical work to illustrate the lecture course with obligatory field excursions.

17.22 Biology.

A continuation of 17.21 General Biology in the more specialised fields of angiosperm systematics, anatomy and physiology; mammalian anatomy; vertebrate histology.

17.23 Experimental Biology.

The experimental investigation of the functions of plants and animals, by the application of methods drawn from the physical sciences.

17.30 Industrial Botany.

A short course for students in Food Technology.

The essentials of the structure and function of higher plants are briefly studied, with special reference to plants which are used for food.

17.31 Botany.

Variations in morphology and anatomy in plants, with examples from the local flora. Angiosperm systematics and plant geography.

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.
17.41 ENTOMOLOGY I.

A basic introduction to the Class Insecta. Classification and systematic; anatomy and morphology, behaviour, social development and ecology of insects.

17.42 ENTOMOLOGY II.

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.

17.43 ENTOMOLOGY III.

Insect physiology. Digestion and the alimentary canal. Sensory recepters and the nervous system. The circulatory and respiratory systems. Hormones, moulting, diapause; temperature and water relations.

17.51 MICROBIOLOGY.

Part I.

General microbiology—morphology and cytology of bacteria, cultural aspects, sterilization and microbial control, isolation and identification.
Moulds and yeasts.
Dairy bacteriology.

Part II.

Pathogenic bacteria causing disease in man.

17.52 MICROBIOLOGY.

Biochemical activities of bacteria.
Growth and multiplication of bacteria. The bacterial growth cycle.
Bacteriophage—its nature and mode of action.
Antigen-antibody reactions. Fundamental principles of serology.
Microbial variation. Mutation and adaptation.
Principles of heat processing.
Mode of action of anti-microbial agents, for example, acridine dyes and their relation to pH and pKa.
Standardisation of disinfectants and criticism of popular methods, for example, phenol coefficient, etc.
The microbiology of food. Food spoilage and "food poisoning".
The use of micro-organisms in industrial processes.
17.53 MICROBIOLOGY.

Introduction.—General biology of fungi. Economic importance.

Classification.—General principles involved in classification. The major groups including the Fungi Imperfecti. Identification and the use of keys.


Morphology and Life-histories.—A study of selected examples from the major groups, including the Fungi Imperfecti. Species of economic importance to be chosen as examples wherever possible.

Spoilage.—General considerations. Mould counts.

Genetics.—An outline of fungal genetics.

17.61 PHYSIOLOGY.

An introductory consideration of the following features of the physiology of both plants and animals will be presented. 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 plant and animal cells.
Synthetic processes in plants and animals with special reference to photo-synthesis and related processes.
Movement of nutrients and water in plants and animals.
Digestive processes in animals and plants.
Respiration and physiological oxidations in plants and animals.
Animal heat regulation.
Intermediary metabolism of carbohydrates, fats, proteins, etc.
Secretory and accumulatory processes in plants and animals.
Excretory processes and hormones and vitamins in the physiology of plants and animals.
Physiology of growth and reproduction.
Excitation and inhibition of nerve, muscle and other animal and plant tissues.
Function of the nervous system in animals. Reflexes. Receptors, including special senses.
Tropisms in plants and animals.
Physiology of movement.

17.71 ZOOLOGY.

A comparative study of the anatomy, morphology and life histories of the invertebrates. Also a further consideration of the mechanisms of evolution, genetics and ecology.
HONOURS IN BIOCHEMISTRY, ENTOMOLOGY, OR MICROBIOLOGY.

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.

Biochemistry I (Science).

This course covers the following topics:

Part I.

A study of the physical and chemical properties of the compounds of biological importance. A detailed study of the principles of enzymology.

Part II.

A study of advanced enzymology and the principal metabolic systems.

In addition, practical work to illustrate the lecture course is given:

Biochemistry IA (Science).

The following topics are dealt with:

Part I.

More advanced physico-chemical studies on proteins, carbohydrates and lipids. Further studies in enzymology with particular reference to metabolic processes.

Part II.

A treatment of physical and chemical evidence for biological concepts including the evolutionary theory.

Practical work to illustrate the lecture course is also given.

Botany I (Science).

In this course the following topics are dealt with:

Part I.

A more detailed study of the plant kingdom dealing with the major groups; evolutionary trends; plant anatomy.

A treatment of plant systematics.
Part II.

Elementary plant ecology (e.g. weed ecology); plant geography, an introduction to plant biochemistry; physiology and cytology.

Practical work to illustrate the lecture course with obligatory excursions and the preparation of a herbarium is also conducted.

Botany II (Science).

The following topics are covered:

Part I.

An extension of the study of plant biochemistry, plant physiology and plant cytology.

Part II.

An advanced treatment of plant biochemistry, physiology and cytology.

In addition, practical work to illustrate the lecture course with obligatory excursions and the preparation of a herbarium is given.

Zoology I (Science).

The following topics are dealt with in this course:

Part I.

A comparative study of invertebrate anatomy and morphology demonstrating the main evolutionary trends and the bases of systematics.

Part II.

An introduction to animal physiology, cytology and genetics.

Practical work to illustrate the lecture course with obligatory field work and preparations of a collection is also given.

Zoology II (Science).

This course will cover the following topics:

Part I.

A comparative study of vertebrate anatomy and morphology; a description of evolutionary mechanism.

Part II.

A study of vertebrate histology and embryology. General treatment of physiology and ecology.

Practical work to illustrate the lecture course with obligatory field work with particular emphasis on ecology is conducted.
INDUSTRIAL ENGINEERING.

Subjects 18.00 to 18.94.

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.  Costing and accounts.
Building design.  Purchasing.
Equipment selection and design.  Quality control.
Product design.  Maintenance.
Layout.  Salvage.
Materials handling.  Methods.
Production planning and control.  Marketing.
Stores and inventory control.  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 (Processes and Materials).

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 forming, casting, shaping, conditioning and surfacing operations applied to these materials.
Preparation of industrial designs and analysis of manufactured products from the design aspect.

18.54 Design for Production II (Interchangeable Manufacture).

The economics of interchangeable manufacture.
The functions of the prototype and the development and uses of the production model.
Design for interchangeability or unit assembly.
The use of standards.
Tolerancing and the determination of accumulated tolerances.
Gauges and gauge wear.
Functional, manufacturing and inspection requirements.
Preparation of component drawings and operation drawings.
Design of jigs, fixtures, tools and gauges.
Metrology.
Small quantity production.

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.

18.94 Marketing.

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.
HUMANITIES AND SOCIAL SCIENCES.

The courses for 1957 will be as follows:

G10 ENGLISH.

A course of 48 lectures on Language and Literature.

The main topics of the Language part of the course are: the nature and use of language as a form of human behaviour; the sounds and qualities of spoken English; the development of the vocabulary and structure of English; the nature of meaning, with studies in the interpretation of prose and verse; the consideration of standards in speech and writing.

Recommended books—


The Literature part of the course is directed towards an appreciation of fiction and drama through a study of selected novels and plays. Questions such as the following are considered: What are the methods of literary criticism? What distinguishes good literature from bad? What is meant by the terms, “theme”, “subject”, “form”, “structure”, “texture”, “style”? What are the distinguishing characteristics of fiction and drama? To what extent are novelists and playwrights bound by the practical demands of their media? What are the means by which a writer sets the mark of his personality on his work? The texts are:

Fiction—


Drama—

Oscar Wilde: *The Importance of Being Earnest*, Penguin.
John Galsworthy: *Strife*, Duckworth.

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 main concerns of modern literature and to encourage critical appreciative reading.

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.
Main Texts—

(a) Drama—
Arthur Miller: Death of a Salesman.
G. Bernard Shaw: The Apple Cart.
J. M. Synge: The Playboy of the Western World.
Ray Lawler: The Summer of the Seventeenth Doll.
Thornton Wilder: Our Town.

(b) Fiction—
E. M. Forster: A Passage to India.
Aldous Huxley: Point Counter Point.
Ernest Hemingway: For Whom the Bell Tolls.
James Joyce: Dubliners.
D. H. Lawrence: Sons and Lovers.
Evelyn Waugh: Decline and Fall.

G13 English.

In this course of sixty-eight lectures roughly the same number of lectures will be given to Language and Literature. The Language work will fall into three broad divisions: (1) Semantics; (2) Speech and phonetics; and (3) The history and characteristics of the English language. In the Literature section the set texts 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.

Texts—

(a) Language—
Simeon Potter: Our Language.
A. G. Mitchell: Spoken English.

(b) Literature—
Shakespeare: Antony and Cleopatra.
J. M. Morrell (ed.): Four English Tragedies.
J. M. Morrell (ed.): Four English Comedies.
T. S. Eliot: Murder in the Cathedral.
G. Bernard Shaw: St. Joan.
Oscar Wilde: The Importance of Being Earnest.
Arthur Miller: Death of a Salesman.
Jane Austen: Sense and Sensibility.
Thomas Hardy: The Return of the Native.
George Orwell: Nineteen Eighty-Four.
F. Scott Fitzgerald: The Great Gatsby.
Samuel Butler: The Way of All Flesh.
James Joyce: Dubliners.
John Steinbeck: The Grapes of Wrath.

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 1890’s 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.

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.

Note.—No textbooks are prescribed for the History courses. Reading lists will be given in class.

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.

No books are prescribed for this course, but any of the following would be useful for reference:

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. In addition to the books mentioned under G30 Philosophy the following is specially recommended:—


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 later 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. References for reading will be given in class.

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.

Reading references will be given in class.
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.

Text Books—

Benham, F.: Economics (5th ed. 1955)

or

Samuelson, P. A.: Economics—An Introductory Analysis (2nd or 3rd ed.).

Hicks, J. R.: The Social Framework (2nd ed.).
Reference Books—

Australia, Department of the Treasury: *National Income and Expenditure*, 1955-56.

Downing, R.: *National Income and Social Accounts* (2nd ed.).

Haberler, G.: *Prosperity and Depression*.

Tew, B.: *Wealth and Income*.

Cairncross, A.: *Introduction to Economics*.

Halm, G. M.: *Monetary Theory*.


G42 ECONOMICS.

This course of forty-eight lectures will not be offered in 1957 but is intended to follow G41 Economics in 1958 and subsequent years. 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.

Text and Reference Books—

As for G41 Economics.

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.

Reference Books—

Miller, J. D. B.: *Australian Government and Politics.*
Greenwood, G. (ed.): *Australia, a Social and Political History.*
Hasluck, P.: *The Government and the People.*
Whittington, D.: *The House will Divide.*
Whittington, D.: *Ring the Bells.*
G52 Government.

The content of this more advanced course of forty-eight lectures is still under consideration. It will probably consist of the following:

(i) a critical study of some political theories, e.g., theories of democracy and communism; and

(ii) a detailed study of some particular political institutions—e.g.:

(a) President, Congress and Supreme Court in the United States; OR

(b) Political institutions of some primitive communities (e.g., in African tribal societies, New Guinea and Papua, etc.); OR

(c) Local government and politics in Australia; OR

(d) Political parties in one or two countries.

The aim will be a concentrated and detailed study, on the one hand, of some general questions of politics, and on the other, of some specific political institutions and organisations.

G53 Government.

There will be two sections to this course of sixty-eight lectures:

(i) A study of the general problems of politics—the field of study, methods used, kinds of conclusions likely to be reached, with examples from the writings of theorists as varied and widely separated in time as Plato, Machiavelli, Marx, Schumpeter, Oakeshott, etc.;

(ii) A study of a working political system—probably the politics and government of the United States.

Books to be recommended later.

G50.1 Government.

This course of thirty-four lectures will be a general introduction to the study of politics, as in G51 Government, but the special reference may be to the political system of the United States, rather than of Australia.

Books to be recommended later.

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.

*Reference Books—*
Munn, N. L.: *Psychology.*
And other references selected by the Lecturer.

**G63 Psychology.**

The outline of this course is the same as that given for G61 Psychology.

**G70 Painting, Sculpture and Allied Arts.**

*Reference Books—*
Stites, R. S.: *The Arts and Man.* 1940.
Illustrated Monographs of the *Phaidon and Skira Editions.*
*History of Art Series.* Pelican.
Newton, E.: *European Painting and Sculpture.* Pelican.
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.

(e) **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.

(f) **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.
TEXT BOOKS.

The following text books are recommended for 1957.*

PHYSICS—1.00 to 1.92.

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<th>SUBJECT</th>
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<td>1.11 Part I</td>
<td>Robertson, J. R.—Introduction to Physical Optics.</td>
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<td>1.41 Physics</td>
<td>Gilbert, N. E.—Electricity and Magnetism.</td>
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<td>1.41b</td>
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<td>1.11 Part II</td>
<td>Stranathan, J. D.—Particles of Modern Physics.</td>
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<td>1.12a</td>
<td>Margenau, H., Watson and Montgomery—</td>
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<td>1.42b</td>
<td>Kronig, R.—Textbook of Physics.</td>
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<tr>
<td>1.92</td>
<td>Frank, N. H.—Introduction to Electricity and Optics.</td>
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<td>1.13 Physics</td>
<td>Robertson, J. R.—Introduction to Physical Optics.</td>
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<td>Semat, H.—Introduction to Atomic and Nuclear Physics.</td>
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<td>Harnwell, G. P.—Principles of Electricity and Electromagnetism.</td>
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<td>1.14</td>
<td>Kittel, C.—Introduction to Solid-State Physics.</td>
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<td>Zemansky, M. W.—Heat and Thermodynamics.</td>
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*Note.—Text books for subjects not listed will be recommended by lecturers in those subjects.
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Gibson, J. J.—The Perception of the Visual World
Hering, E.—Spatial Sense and Movements of the Eye.
Luneburg, R. K.—Mathematical Analysis of Binocular Vision.

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Latimer, W. M., and Hildebrand, J. H.—Reference Book of Inorganic Chemistry (Revised Edition, 1940), Bound with

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Albert—Electronics and Electron Devices.

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2.34 Physical Chemistry

 Alexander, A. E., and Johnson, P.—Colloid Science.
 Harrison, G. R., Lordand and Loofbourow—Practical Spectroscopy.
 Steiner, L. E.—Introduction to Chemical Thermodynamics.
 Nachtrieb, N. H.—Principles and Practice of Spectrochemical Analysis.
 Laidler, K. J.—Chemical Kinetics.
 Hinshelwood, C. N.—The Structure of Physical Chemistry.
 Hinshelwood, C. N.—Kinetics of Chemical Change.

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 Short, L. N., and Simes, J. J.—General Chemistry.
 University of Technology.

2.42 Inorganic Chemistry

 Sidgwick, N. V.—Chemical Elements and Their Compounds (2 vols.).

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 Coulson, C. A.—Valence.
 Van Arkel, A. E.—Molecules and Crystals.

2.52 Quantitative Analysis


2.53 Quantitative Analysis

 Lundell, G. E. F., and Hoffman.—Outlines of Methods of Chemical Analysis.
 Walton, H. F.—Principles and Methods of Chemical Analysis.
 Welcher, F. J.—Organic Analytical Reagents.
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2.65A Applied Organic Chemistry—contd.
Simonds, H. R., and Ellis, C.—Handbook of Plastics.
Rosenberg, H. R.—Chemistry and Physiology of the Vitamins.
Harris, R. S., and Thimann, K. V.—Vitamins and Hormones—Advances in Research and Applications.
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British Pharmacopoeia.
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2.65B Applied Organic Chemistry.
Neurath, H., and Bailey, K.—Proteins.
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Kent-Jones, D. W., and Amos, A. J.—Modern Cereal Chemistry.
Sebrell, N. H., and Harris, R. S.—The Vitamins Series.
Karrer, P., and Jucker, E.—Carotenoids.

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Crumpler, T. B., and Yoe, J. A.—Chemical Computation and Errors.
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Brownlee, K. A.—Industrial Experimentation.
Moroney, M. J.—Facts from Figures.

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Davies, O. L. (Ed.)—Statistical Methods in Research and Production.
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3.14  Industrial Chemistry

3.14a  Chemical Process Industries

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Groggins, P. H.—Unit Processes in Organic Synthesis.
Rogers, A.—Industrial Chemistry.
Martin, G.—Industrial and Manufacturing Chemistry (2 vols.).

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3.24  Chemical Engineering Unit Operations

3.34  Chemical Engineering Design

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Ott, E., Spurlin and Grafflin—Cellulose and Cellulose Derivatives.
Vickerstaff, T.—The Physical Chemistry of Dyeing.
Schölknecht, C. E.—Polymer Processes.
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Perry, J. H.—Chemical Engineers’ Handbook.
Brown, G.—Unit Operations.
Badger, W. L., and Banchero, J. T.—Introduction to Chemical Engineering.
Coulson, J. M., and Richardson, J. I.—Chemical Engineering.
Treybal, R. E.—Mass Transfer Operations.

Low, D. A.—Pocket Book for Mechanical Engineers.

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Mechanical World Pocket Book.

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Perry, J. H.—Chemical Engineers’ Handbook.

OR

B.S.I.—Fusion Welded Pressure Vessels. B.S. Code 1500.
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Marks, L. S.—Mechanical Engineers' Handbook.
A.S.M.E. Boiler Construction Code.
S.A.A. Code for Corrosion-Resisting Steel Boilers.
C.B.10.
S.A.A. Welding Code.  C.A.S.
S.A.A. Code for Structural Steel in Buildings.
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Lewis, W. K., Radosch and Lewis—Industrial Stoichiometry.
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Chambers, E. G.—Statistical Calculations for Beginners.
Lipka, J.—Graphical and Mechanical Computations.
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Hougen, O. A., Watson and Ragatz—Chemical

Dodge, B. S.—Chemical Engineering Thermodynamics.

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Hinshelwood, C. N.—Kinetics of Chemical Change.

3.814 Food Technology I...

Baumgartner, J. G.—Canned Foods.

Tressler, D. K., and Evers, C. F.—The Freezing
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Blanck, F. C.—Handbook of Food and Agriculture.

Reference.

Jacobs, M. B.—Chemistry and Technology of
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Newton, J.—Introduction to Metallurgy (2nd

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Street, A., and Alexander, W.—Metals in the

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<td>Sachs, G., and Van Horn, K.—Practical Metallurgy. A.S.M.</td>
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<td>Bain, E. C.—Functions of the Alloying Elements in Steel. A.S.M.</td>
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<td>Grossman, M. A.—Elements of Hardenability. A.S.M.</td>
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<td>Kayser—Basic Engineering Metallurgy.</td>
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<td>Evans, U. R.—Introduction to Metallic Corrosion.</td>
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**MECHANICAL ENGINEERING—5.00 to 5.74.**

| 5.101 Engineering Drawing and Materials. | Institution of Engineers, Australia—Australian Standard Engineering Drawing Practice. (S.A.A. Standard No. CZ1.) |
| | Sydney Technical College—Lecture Notes for Mechanical Engineering I. |
### MECHANICAL ENGINEERING—5.00 to 4.74—continued.

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- S.A.A. Crane and Hoist Code, C.B. 2.
- Sydney Technical College—Lecture Notes for Mechanical Engineering IIIA.

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6.104 Electrical Engineering


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6.224 Electrical Machines...
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6.23 Electric Power Engineering.

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6.23A Utilization and Control of Electrical Plant.


Reference.


6.23B Same as for 6.224—Electrical Machines.

6.303 Electronics.


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6.303A Electronics.


Reference.


6.303B Electronics.


Reference.


6.304A Industrial Electronics and Control.


6.304B Industrial Electronics and Control.

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**Electrical Engineering—6.00 to 6.35—continued.**

**Reference.**


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### MINING ENGINEERING AND APPLIED GEOLOGY—7.00 to 7.703.

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<td>Elford, H. S., and McEwan, M. R.—Coal Mining in Australia.</td>
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<td>Lewis, R. S.—Elements of Mining.</td>
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<td>7.002 Coal Mining ...</td>
<td>Statham, C. F.—Coal Mining.</td>
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<td>N.S.W. Department of Mines—Prospectors' Guide.</td>
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<td>Given, I. A.—Mechanical Loading of Coal Underground.</td>
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<td>Young, G. J.—Elements of Mining.</td>
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7.023 Mining Engineering ... Fraenkel, K. H. P.—Manual of Rock Blasting. 
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Whitaker, J. W.—Mine Lighting.  
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7.513 Advanced Mineralogy

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Zittel, Carl A. von—*Textbook of Palaeontology*.

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Edwards, A. B.—*Texture of the Ore Minerals*.

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Stutzer and Noe—*Geology of Coal*.
Legget, R. F.—*Geology and Engineering*.
Heiland, C. A.—*Geophysical Exploration*.

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- Reports of Scientific Societies and Geological Surveys.
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**CIVIL ENGINEERING—8.00 to 8.94.**

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8.112 Strength of Materials
Longmans, Green.
Timoshenko, S. P., and McCulloch, G. H.—
Elements of Strength of Materials.

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Reference.
Stewart, D. S.—Practical Design of Simple Steel Structures (Vols. I and II, 3rd and 2nd Editions respectively).
Grinter, L. E.—Design of Modern Steel Structures.
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Higgins, A. L.—*Elementary Surveying*.

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Thomas, W. N.—*Surveying*.

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- Trorey, L. G.—*Handbook of Aerial Mapping*.
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8.53 Fluid Mechanics ... Rouse, H.—Elementary Mechanics of Fluids.

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Reference.

Rouse, H. (Ed.)—Engineering Hydraulics.
Addison, H.—Hydraulic Measurements.

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Streeter, V. L.—Fluid Dynamics.
Davis, C. V.—Handbook of Applied Hydraulics.

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8.63B Hydrology ... ... Linsley, R. K., Kohler and Paulhas—Applied Hydrology.
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Haurwitz, B., and Austin, J. M.—Climatology.
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Steel, E. W.—Water Supply and Sewerage.
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Metcalfe, L., and Eddy, H. P.—Sewerage and Sewage Disposal.
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Salmon, E. H.—Materials and Structures (Vol. 1).
Williams, S. R.—Hardness and Hardness Measurement.
A.S.T.M., B.S.I. and S.A.A.—Specifications, Special References, etc.
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<td>Murphy, G.</td>
<td><em>Advanced Mechanics of Materials.</em></td>
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<td>Freudenthal, A. M.</td>
<td><em>The Inelastic Behaviour of Engineering Materials and Structures.</em></td>
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<td>Jessop, H., and Harris, F.</td>
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<td>Lee G. H.</td>
<td><em>An Introduction to Experimental Stress Analysis.</em></td>
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### WOOL TECHNOLOGY—9.00 to 9.94.

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<th>9.104 Nutrition</th>
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<td>Hahn, E. T., and Garner, F. H.</td>
<td><em>Principles and Practice of Feeding Farm Animals.</em></td>
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<td>Morrison, F. B.</td>
<td><em>Feeds and Feeding.</em></td>
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<td>Belschne, H. G.</td>
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<td>Fraser, A.</td>
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<td>Hammond, J.</td>
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<td>Coffrey</td>
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<td>Phillips, R. W.</td>
<td><em>Breeding Animals Suited to Unfavourable Environments.</em></td>
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<td>Beattie, W. A.</td>
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<td>Snapp, R. R.</td>
<td><em>Beef Cattle.</em></td>
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<td>Roberts, F. H.</td>
<td><em>Insects Affecting Livestock.</em></td>
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<td>Sisson, S.</td>
<td><em>Anatomy of Domestic Animals.</em></td>
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<td>Dukes, H. H.</td>
<td><em>Physiology of Domestic Animals.</em></td>
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<td>Schafer, Sir E. S.</td>
<td><em>Essentials of Histology.</em></td>
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<td>Trautmann and Fiebigor</td>
<td><em>Fundamentals of the Histology of Domestic Animals.</em></td>
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<td>McMeekan, C.P.</td>
<td><em>Principles of Animal Production.</em></td>
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<td>Hammond, J.</td>
<td><em>Farm Animals.</em></td>
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<td>Nicholls, J. E.</td>
<td><em>Livestock Improvement.</em></td>
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<tr>
<td>Ashton, L. G. (Ed.)</td>
<td><em>Dairy Farming in Australia.</em> (N.S.W. Edition.)</td>
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<td>Hungerford, T. G.</td>
<td><em>Diseases of Livestock.</em></td>
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<td>Kelley</td>
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## WOOL TECHNOLOGY—9.00 to 9.94—continued.

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<th>Subject</th>
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Yorston, R. K., Smyth and Brown—*Accounting Fundamentals.*  
Goldberg, L.—*A Philosophy of Accounting.* |
| **Reference.** | Mitchell (Ed.)—*Essays on the Australian Constitution.*  
Baalman, J.—*Outline of Law in Australia.* |
Russell, E. J.—*Soil Conditions and Plant Growth.*  
C.S.I.R.O.—*The Australian Environment.* |
Beadle, N. C.—*Vegetation and Pastures of Western N.S.W.*  
Black, J. M.—*Flora of South Australia (Parts I and II).*  
Levy, E. B.—*Grasslands of New Zealand.* |
| **9.34 Banking, Currency and Exchange** | Mills and Walker—*Money.*  
Benham F.—*Economics.*  
| **Reference.** | Renwick and Simpson Lee—*The Economic Pattern.*  
Gifford, Wood and Reitsma—*Australian Banking.* |
| **9.74 Fibre Science...** | Preston, J. M.—*Fibre Science.*  
British Wool Manual.  
Luniak, B.—*Identification of Textile Fibres.*  
Textile Institute of Dyers and Colourists—*Textile Progress.* |
| **9.94 Genetics...** | Snyder, L. H.—*Principles of Heredity.*  
Lush, J. L.—*Animal Breeding Plans.*  
Lerner—*Population Genetics and Animal Improvement.*  
Dunn, L. C.—*Genetics in the 20th Century.*  
Mather—*Biometrical Genetics.*  
Snedecor, G. W.—*Statistical Methods.*  
Goldschmidt, R. B.—*Understanding Heredity.*  
Scheinfeld, A.—*The New You and Heredity.*  
Kelley, R. B.—*Principles and Methods of Animal Breeding.*  
Hagerdoorn, A.—*Animal Breeding.* |
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10.11 Mathematics

... Durell, C. V., and Robson, A.—Elementary Calculus, Vols. I, II. Bell.

10.12 Mathematics


Reference.

Bell, R. J. T.—Co-ordinate Geometry of Three-dimensions. Macmillan.

10.13 Mathematics

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Paradine, C. G. and Livett, B. H. P.—Statistics for Technologists, E.U.P.

10.43 Statistics

... Hoel, P. G.—Introduction to Mathematical Statistics. Wiley.

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Mather, K.—Statistical Analysis in Biology. Methuen.


10.91 Mathematics


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Mather, K.—Statistical Analysis in Biology. Methuen.


MATHEMATICS—10.00 to 10.32—continued.

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* Introductory Reading.

Reference.
Aitken, A. C.—Statistical Mathematics. Oliver and Boyd.


Reference.
Further references for particular topics including journal references, will be given by the lecturers.
ARCHITECTURE—11.00 to 11.96.

11.101 Structures I


Reference.
Hook, A. S.—A Little about Structural Mechanics.

Reference.
Handbook of Structural Timber Design (Technical Paper No. 32).
Parker, H.—Simplified Design of Structural Timber.
Stewart, D. S.—Practical Design of Simple Steel Structures (Vol. I).
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Reference.
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Parker, H.—Simplified Design of Structural Timber.
Stewart, D. S.—Practical Design of Simple Steel Structures (Vol. I).
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Husband, J., and Harby, W.—Structural Engineering.
Sutherland, H., and Reece, R. C.—Introduction to Reinforced Concrete Design.

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Stewart, D. S.—Practical Design of Simple Steel Structures (Vol. II).

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Department of Labour and National Service—Practical Geometry.
Reekie, R. F.—Draughtsmanship.
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Reference.
Knudsen, W. O., and Harris, C. M.—Acoustical Designing in Architecture.
Bagenal, Hope—Practical Acoustics.
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ARCHITECTURE—11.00 to 11.96—continued.

**SUBJECT.** TEXT BOOK.

**11.32** Architectural Studies and Design.
- Teague, W. D.—*Design This Day.*
- Moholy-Nagy, L.—*Vision in Motion.*
- Scott, R. G.—*Design Fundamentals.*
- Scott, R. G.—*The Studio Book of Alphabets.*

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- Holmes, J. M.—*Applied Perspective.*
- Graves, M.—*The Art of Colour and Design.*
- Rathbone, R. A.—*Introduction to Functional Design.*
- Ostwald, W.—*Colour Science.*
- Munsell, A. H.—*A Colour Notation.*
- Evans, R. M.—*An Introduction to Colour.*
- Kepes, G.—*The Language of Vision.*
- Brett, L.—*The Things We See (Series)—Houses.*
- Russell—*The Things We See (Series)—Furniture.*
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**11.41** History of Architecture.
- Fletcher, Sir Banister—*History of Architecture—On the Comparative Method.*
- Briggs, M. S.—*Architecture.*

**Reference.**
- Normand, C. P. J.—*A Parallel of the Orders of Architecture.*
- Richardson, Sir Albert E.—*Monumental Classic Architecture in Great Britain and Ireland during the 18th and 19th Centuries.*
- Whittick, A.—*European Architecture in the 20th Century.*
- Mumford, L.—*Culture of Cities.*
- Giedion, S.—*Space, Time, and Architecture.*
- Pevsner, N.—*Outline of European Architecture.*
- Herman, M.—*The Early Australian Architects and Their Work.*
- Reid, D. A. G.—*Building Science* (2 vols.).

**11.51** Building Science...

**Reference.**
- Fitzmaurice, R.—*Principles of Modern Building.*
- Withey, M. O., and Washa, G. W.—*Materials of Construction.*
- Shute, M. A.—*Modern Building Materials.*
ARCHITECTURE—11.00 to 11.96—continued.

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Phillips, R. O.—Sunshine and Shade in Australasia.

**Reference.**

Billington, N. S.—Thermal Properties of Building.

Fitzmaurice, R.—Principles of Modern Building.


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Mackey, G. F.—Gregory's Modern Building Practice in Australia.

Sharp, W.—Australian Methods of Building Construction.


Nield, D.—Walls and Wall Facing.


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Giedion, S.—Space, Time, and Architecture.

Towndrow, F. E.—Architecture in the Balance.

Chatto and Windus.

APPLIED PSYCHOLOGY—12.00 to 12.94.

12.01 Psychology I.  ...  Munn, N. L.—Psychology. Houghton Mifflin.

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Crafts, L. W. et al.—Recent Experiments in Psychology (1st and 2nd Editions).
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Ruch, F. L.—Psychology and Life. Scott Foresman.

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Young, P. T.—Motivation of Behaviour. Wiley.
Werner, H.—Comparative Psychology of Mental Development. Follett.
Zubek and Solberg—Human Development. McGraw-Hill.

12.03 Psychology III ... Eysenck, H. J.—The Structure of Human Personality. Methuen.
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Allport, G.—Personality. Constable.

12.10 Psychological Assessment I.


12.20 Psychology IV—Social.

Asch, S.—Social Psychology.
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- Viteles, M. S.—*Motivation and Morale in Industry*. Staples Bros. Ltd.
- Blum, M. L.—*Readings in Experimental Industrial Psychology*, Prentice Hill.
- Viteles, M. S.—*Industrial Psychology*.

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<td>Industrial and Labour Relations.</td>
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- Johnson, P. H., Boise and Pratt—*Job Evaluation*. Wiley.

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- Blum, M. L. and Balinsky, B.—*Counselling and Psychotherapy*. Prentice Hill.
- Fenichel, O.—*Psychoanalytic Theory of Neurosis*. 
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<td>N.S.W. Parliament—Statutes—<em>The Companies Act, N.S.W.</em>, 1936.</td>
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<td>Adamson, A. V.—<em>Valuation of Company Shares and Businesses</em>. Law Book Co.</td>
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<td>Seed, H. E.—<em>Goodwill as a Business Asset</em>. Gee and Co.</td>
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<td>Leake, P. D.—<em>Commercial Goodwill</em>. Pitman.</td>
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Vatter, W. J.—Managerial Accounting. Prentice Hall.
Scott, W. D.—Cost Accounting. Law Book Co.
Australian Institute of Cost Accountants—Cost Bulletins. (As recommended by the lecturers.)

Reference.


14.16 Advanced Cost Accounting.
Devine, C. T.—Cost Accounting and Analysis.

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Australian Institute of Cost Accountants—Cost Bulletins. (As recommended by the lecturers.)
National Association of Cost Accountants Bulletins. (As recommended by the lecturers.)
14.23 Auditing

Irish, R. A.—Auditing Theory and Practice. Law Book Co.

Reference.


Kohler, E.—Auditing. Prentice Hall.

14.33 Taxation


Reference.


Challoner and Greenwood—Land Tax Law and Practice.
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The Law Book Company's Industrial Arbitration Service.


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- Rose, T. G.—*The Internal Finance of Business Undertakings*. Pitman.

### ECONOMICS—15.00 to 15.22.

| | *Official Year Book of the Commonwealth of Australia, 1955* (No. 41) or later edition. |
| | *Recommended for purchase.* |
ECONOMICS—15.00 to 15.22—continued.

15.11 Descriptive Economics—cont.

Nankervis, F. T.—Descriptive Economics. Longmans.
Nicholson, D. F.—Australia’s Trade Relations. Cheshire.
Wilkes, J. (Ed.)—Australia’s Transport Crisis (A.I.P.S.)—Angus and Robertson.
Wood, G. L.—Australia.

15.12 Economics I ...

Boulding, K. E.—Economic Analysis.
Tarshis, L.—Elements of Economics.
Benham, F.—Economics.

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Crowther, G.—An Outline of Money.
Hicks, J. R.—The Social Framework.
Downing, R. I.—National Income and Social Accounts.
Sayers, R. S.—Modern Banking.
Harrod, R. F.—International Economics.
Baumol, W. J.—Economic Dynamics.

15.13 Economics II ...


Reference.
Hicks, J. R.—Value and Capital (Parts 1 and 2 only). Clarendon Press.
Fraser, L. M.—Economic Thought and Language (Esp. Chapters 1, 4 to 8, 10 to 13). A. and C. Black.
Robinson, J.—The Economics of Imperfect Competition. Macmillan.

* Recommended for purchase.
ECONOMICS—15.00 to 15.22—continued.

SUBJECT.

15.13 Economics II—cont.

Text Book.

Reference.


Ellis, H. S. (Ed.)—Survey of Contemporary Economics (Chapters 1, 3 and 4). Blakiston.


15.21 Statistical Method I...


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Reference.


* Recommended for purchase.
HOSPITAL ADMINISTRATION—16.00 to 16.9.

SUBJECT.

16.2 Administrative Aspects of Medicine.

TEXT BOOK. Ponton—The Medical Staff of the Hospital.

Reference. Davis—Medical Care for Tomorrow
Brunger—The Doctor's Job.
Deitrich and Benson—Medical Schools in the U.S. at Mid-Century.

16.3 Fundamentals of Medical Science.

BUFFKIN—Medical Terminology Made Easy.

Reference. Roberts—Medical Terms, Their Origin and Construction.
Neese and Swett—Introduction to Medical Science for Medical Record Librarians.
Whillis—Elementary Anatomy and Physiology.

16.4 Fundamental Operations of the Hospital.

MACEACHERN—Hospital Organisation and Management.

Reference. Stone—Hospital Organisation and Management.
Australian Institute of Hospital Administrators—Training Manuals.

16.5 Principles of Hospital Administration.

MCGIBONY—Principles of Hospital Administration.
Bachmeyer and Hartman—The Hospital in Modern Society.
Bachmeyer and Hartman—Hospital Trends and Developments.

Sloan—This Hospital Business of Ours.
Hayt—Law of Hospital, Physician and Patient.
Speller—The Law Relating to Hospitals and Similar Institutions.
Regan—Doctor, Patient and the Law.
Scott, Clothier and Spreagle—Personnel Management.
Bailey—Personnel Management.
National League of Nursing Education—Hospital Nursing Service Manual.
Lambertsen—Nursing Team Organisation and Function.
The Joint Commission on Education—Problems of Hospital Administration.
Miller—Hospital Public Relations.
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16.6 Hospital Organisation
MacEachern—Hospital Organisation and Management.

Reference.
Lacy—Purchasing for Hospitals.
West and Wood—Food Services in Institutions.
Dana—Kitchen Planning for Quality Food Service.
La Belle and Barton—Administrative Housekeeping.
Gill—Organisation and Staffing of Hospital Housekeeping Departments.
Crete-Dahl—Housekeeping Department and Building Operation Maintenance.
Nuffield Provincial Hospital Trust—Status and the Functions and Design of Hospitals.
Vines—Background to Hospital Planning.

16.7 Advanced Hospital Administration.
Roswell—Accounting Statistics and Business Office Procedures.
Commission on Hospital Care—Hospital Care in the United States.

Reference.
Bachmeyer—Issue of Compulsory Health Insurance.
Symons—Public Health in the World Today.
Resman—Preventative Medicine.
Huffman—Manual for Medical Record Librarians.

16.8 Biostatistics
Bradford Hill—Principles of Medical Statistics.

BIOLOGICAL SCIENCES—17.00 to 17.71.

17.11 Biochemistry
Fruton and Simmonds—General Biochemistry.

17.12 Biochemistry
Baldwin—Dynamic Aspects of Biochemistry.

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Reference.
Nielands and Stumpf—Outlines of Enzyme Chemistry.

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Reference.
Sumner and Myrbach—The Enzymes (Vols. I and II).
Underkoffler and Hickey—Industrial Fermentations.

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17.21 General Biology ... Murray—Biology.
Buchbbaum—Animals without Backbones.
Besley and Meyer—Field Work in Animal Biology.
Abercrombie, Hickman and Johnson—A Dictionary of Biology.

Reference.
Smith et al.—Textbook of General Botany.
McLuckie and McKee—Australian and New Zealand Botany.
Grove and Newell—Animal Biology.
Dakin, Bennett and Pope—Australian Sea Shores.
White—The Chromos.
Gillison—Histology of the Body Tissues.
Maximow and Bloom—Textbook of Histology.
Simpson—The Meaning of Evolution.
Romer—Man and the Vertebrates.
Wells and Wells—General Biology.
Cain—Animal Species and their Evolution.

17.22 Biology ... ... Romer—The Vertebrate Body.
Gillison—Histology of the Body Tissues.
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Weichert—Anatomy of Crustacea.
Fernald and Sheppard—Applied Entomology.
Jones—Introduction to Floral Mechanisms.
Hill—Economic Botany.
Eames and MacDaniels—Introduction to Plant Anatomy.
McLuckie and McKee—Australian and New Zealand Botany.

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Esae—Plant Anatomy.
Rendle—Classification of Flowering Plants (Vols. I and II).
Lawrence—Taxonomy of Vascular Plants.
McLuckie and McKee—Australian and New Zealand Botany.
Daubenmire—Plants and Environment.
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17.41 Entomology I  ...  Imms—Textbook of Entomology.

Reference.

Tillyard—*Insects of Australia and New Zealand*.
Snodgrass—*Principles of Insect Morphology*.

17.42 Entomology II  ...  Roeder—*Insect Physiology*.
17.43 Entomology III  ...  Metcalf, Flint and Metcalf—*Destructive and Useful Insects*.

Reference.

Wigglesworth—*Principles of Insect Physiology*.
Fernald and Sheppard—*Applied Entomology*.
Andrewortha and Birch—*The Distribution and Abundance of Animals*.

17.51 Microbiology  ...  Salle—*Fundamental Principles of Bacteriology*.
Clifton—*An Introduction to the Bacteria*.
Gardner—*Bacteriology for Medical Students and Practitioners*.
Bigger—*Handbook of Bacteriology*.
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Muir and Ritchie—*A Manual of Bacteriology*.
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Smith and Martin—*Zinsser's Textbook of Bacteriology*.
Wilson and Miles—*Principles of Bacteriology and Immunity*.
Anderson—*An Introduction to Bacteriological Chemistry*.

17.52 Microbiology  ...  Gale—*The Chemical Activities of Bacteria*.
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Baumgartner—*Canned Foods—An Introduction to Their Microbiology*.
Jensen—*Microbiology of Meats*.
Tanner—*Microbiology of Foods*.
Lodder and Kreger—*The Yeasts—A Taxonomic Study*.
Werkman and Wilson—*Bacterial Physiology*.
Prescott and Dunn—*Industrial Microbiology*. 
BIOLOGICAL SCIENCES—17.00 to 17.71—continued.

SUBJECT.

17.53 Microbiology

TEXT BOOK.

Alexopoulos—Introductory Mycology.
Bessey—Morphology and Taxonomy of Fungi.

Reference.

Wolf and Wolf—The Fungi (Vols. I and II).
Ainsworth and Bisby—Dictionary of the Fungi.
Large—The Advance of the Fungi.
Smith—Introduction to Industrial Mycology.
Buller—Researches on Fungi (Vols. I–VI).
Hawker—Physiology of the Fungi.
Waksman—Principles of Soil Microbiology.
Forster—Chemical Activities of the Fungi.
Cartwright and Findlay—Decay of Timber and its Prevention.

17.71 Zoology

Imms—Textbook of Entomology.
Grove and Newell—Animal Biology.
Storer—General Zoology.
Borradaile et al.—The Invertebrata.
Parker and Haswell—Textbook of Zoology.
Tillyard—Insects of Australia and New Zealand.
Sinnott et al.—Principles of Genetics.
Dobzhansky—Genetics and the Origin of Species.
Mays, Linsley, and Usinger—Methods and Principles of Systematic Zoology.
Bullough—Practical Invertebrate Anatomy.
Weichert—Anatomy of Chrodates.
Consistent progress has been made throughout the year in all major branches of the University's activities. Two pleasing achievements of particular importance have been the establishment of several more Schools on the site at Kensington and the extension of facilities for advanced specialised instruction and research in relatively new fields, such as automatic control, television and nuclear engineering. The standards previously attained in the more traditional studies have been maintained, and there has been an appreciable increase in the amount of post-graduate research being undertaken in the various Schools.

Enrolments in the University's courses have increased in 1956 to 5,309 from the 1955 figure of 4,746. The number of students registered in day degree and conversion courses for 1956 is 855 compared with 726 in 1955, while enrolments in part-time degree and diploma courses have increased from 2,832 to 3,377. Candidates for higher degrees now number 238, a considerable increase on last year's 187. This general increase in enrolments is also reflected in the figures for Newcastle University College where 626 students are now registered compared with 539 in 1955.

During the year the University continued its policy of conducting graduate and special courses, providing an opportunity for practising scientists and technologists to keep informed of recent developments in their field. Eighteen courses were offered, for which 646 persons enrolled. Two repeat series of courses conducted in the previous year were given, following many requests for these from personnel in industry. The effective promotion of this side of the University's activities by members of staff and the continuing support from industry for these advanced courses are most gratifying to the Council.
The Council is very pleased to report that Lieut.-General Sir John Northcott, Governor of New South Wales became a member of the University at an impressive ceremony held on 19th June, 1956, when the Chancellor, Mr. Wallace C. Wurth, conferred on His Excellency the degree of Doctor of Science (Honoris Causa).

In accordance with the amendments to the incorporating act of the University, as set out in the last annual report of Council, two members were appointed to Council during the year as the representatives of the agricultural, pastoral and rural interests of the State.

This widening of the representation of Council coincides with an increasing concern by the University in scientific problems associated with the primary industries. Research into such problems is now being extended in several Schools. In addition to the numerous projects directly related to primary industries now being conducted in the Schools of Wool Technology and Applied Chemistry, work on certain aspects of agricultural engineering is proceeding in the School of Mechanical Engineering and problems of water research are being investigated in the School of Civil Engineering. This School is cooperating with the Water Research Foundation of Australia (Ltd.), which was launched at the highly successful Symposium on "The Water Resources of Australia—their Control and Development", held at the University in November, 1955.

The Council has always recognised that one of the main functions of the University of Technology must be to initiate developments in tertiary education outside the traditional disciplines. While considerable success has already been achieved in this direction in previous years, Council was of the opinion that a stage had been reached where the University could proceed with a more rapid extension of the specialised functions. Consequently, the University has this year entered several new areas of activity. Appointments have been made to several recently created Chairs in specialised fields. Plans are well advanced for courses in Textile Technology, Accountancy and Economics, and initial steps have been taken to provide courses in Highway Engineering, Traffic Engineering, Hospital Administration and Fuel Technology.

Connected with the provision of additional facilities for training in highly specialised subjects, was a review during the year of the organisation of the Faculties within the University. It was considered that while the Faculties, as originally constituted had operated efficiently up to the present time, their administration was becoming increasingly difficult owing to the growing membership and the rather heterogeneous composition of the larger Faculties. In order to facilitate the administration of the Faculties and to ensure their continued efficient operation, some revision of their composition was
thought necessary. It was also considered that, in view of the special functions and responsibilities of the University in promoting technological development, a separate Faculty of Technology should be established. By bringing together in one Faculty the Schools most closely associated with Technology, it was thought that the University would be better fitted to extend its already significant activities in this field. Consequently, in May, 1956, the approval of Council was given to increasing the number of Faculties to six, to include a Faculty of Technology, and to the re-organisation of the existing Faculties as from 1st June, 1956. The composition of the revised Faculties is given in detail in this report.

The activities of the Institute for Nuclear Engineering, established within the University during the preceding year, are becoming an important element in the successful carrying out of the University's main objective of providing advanced scientific and technological instruction and undertaking research. Courses of special lectures for graduates are now being prepared by the Institute and the research work being undertaken on behalf of the Institute in this new field includes projects concerned with the application of nuclear engineering to industrial processes. Details of the research appear later in the report.

In addition to these new developments, work on a number of long term research projects has continued in the various Schools, and close co-operation with industry and commerce has been maintained in the conduct of specific investigations on behalf of industrial undertakings and government departments. The second Research Report of the University, covering the period July, 1953 to December, 1955, has been prepared and will be published shortly.

The second graduation ceremony to be held at Kensington took place on 14th April, 1956, when degrees were conferred on 131 students. Twenty-two higher degrees were awarded. At the conclusion of the Ceremony, the Schools on the Kensington site were open for inspection, and more than 2,000 people attended the various displays and demonstrations arranged by the Schools. The keen interest shown by visitors in the University's activities was most encouraging, and Council is appreciative of the contribution of staff and students to the success of the Open Day.

The membership of the professorial staff was increased during the year by appointments made to the Foundation Chairs of Accountancy, Economics, and Textile Technology, to the Chair of Inorganic Chemistry, and to the Nuffield Research Chair in Mechanical Engineering. Appointments made to the recently established Chairs in Traffic Engineering and Highway Engineering will be taken up later in the year. The approval of Council was given to the creation of Chairs in Fuel Technology and in Hospital Administration.
The Schools of Applied Psychology and Mathematics and the Department of Production Engineering were transferred from Broadway to the Kensington site, and the new Schools of Accountancy, Economics and Textile Technology were established at Kensington during the year. This brings the number of Schools now at Kensington to fifteen. A new single-storey monocrete building on the western side of Anzac Parade, in which four Schools are housed, is nearing completion, and work is proceeding on the first of a group of buildings for the Faculty of Science on the main site. Several other building projects are well advanced, details of which are given later in this report.

The Newcastle University College has continued to extend its activities during the year under review. The Department of Arts has again increased the number of courses offered to candidates for a degree in Arts, and this development has been facilitated by the provision of additional accommodation for the Department. A most successful Open Day was held at Newcastle on 16th July, 1955, when 5,000 visitors inspected the buildings and equipment of the College. The Council appreciates the assistance given during the year by members of the Newcastle University College Advisory Committee. An account of the progress made at Newcastle appears in the report.

Finance.

The income of the University for the financial year, 1st July, 1955, to the 30th June, 1956, was £1,296,555 10s. 4d. The principal elements of the income were the State grant of £996,250 and the Commonwealth Assistance Grants, £175,704. Income from fees amounted to £118,977 and other income £9,298. The main items of expenditure were salaries and staff charges £1,110,897, materials and minor equipment £73,696, repairs and general maintenance £20,085, books, periodicals and pamphlets £19,826, power, lighting and heating £13,081.

During the financial year, the University was informed through the Minister for Education of the intention of the Colonial Treasurer to supplement the current State grant to the extent of £53,000 for this financial year. At the same time, the Colonial Treasurer informed the University that, while he found it extremely difficult to commit additional expenditure against next year's budget (particularly when the State was in heavy deficiency), the need for the University to have some firm minimum basis upon which to plan was recognised and the University might assume that a grant of £1,100,000 would be available next financial year and it would be open to the University to add to this grant any unexpended balance from the current year's grants and such additional income from the adjustment of fees and from other sources which it might be able to raise on its own behalf.
The additional State grant of £53,000 was a direct consequence of representations made by the Council of the University in light of its analysis of the effect of the current grant on the staffing requirements of the University.

The supplementary grant was devoted in the first instance to meeting any deficit that arose in the 1955/56 running expenses and any balance will be devoted to meeting the cost in the 1956/57 financial year of the salaries of any additional staff recruited (a) to fill vacancies on the staffing establishments; and (b) to fill new positions considered essential.

As the current financial year opens, the University has accepted an obligation to make economies in its staffing and other votes to achieve a savings of upwards of £40,000. The obligation to achieve these savings has been willingly accepted by the University Administration, and by its teaching Schools even though the basic budget is a restricted one that allows for very little progress in a developing institution.

It will be necessary for these savings to be achieved by not filling any vacancy that occurs in the staffing establishment, by standing-down a substantial proportion of part-time staff in third term, and by further reducing the amount available for classroom materials and plant replacements. Unless the University can add to its income by increasing fees and from other sources, our costs must be reduced. As the principal element in our costs is staffing, these costs must be reduced—

(a) by requiring existing staff to accept progressively increased responsibility in future years; and

(b) by curtailing and withdrawing educational services and research work.

The University of Technology, as a concept, is still incomplete—many new courses have not yet run their full length, many activities, e.g., Arts at Newcastle, Commerce, Textile Technology, have yet to meet their full staffing commitments; in the older Schools, Civil Engineering, Electrical Engineering and Metallurgy, existing staff can only take the first strain of what is expected in a modern University, while the demands of the new technologies which cannot be resisted have not yet been estimated in terms of cost.

Following very helpful discussions with the Minister for Education and with the Treasury officials on the financial problems of the University, the Executive Committee of the Council have decided to recommend to Council that University fees for all courses except the Arts courses at Newcastle, shall be increased from the beginning
of the 1957 academic year by 50 per cent, and for the Arts courses at Newcastle, the fees shall be made the same as those now ruling at the University of New England. It has been estimated that fees increases will raise an additional £45,000 towards University expenses in the 1956/57 financial year.

Furthermore, the University has called the attention of the Commonwealth Office of Education to certain interpretations of the Commonwealth aid to University schemes in which this University feels that it has not received complete equality of treatment. The University is hopeful from assurances received that the Commonwealth grants may be adjusted in our favour in the next financial year.

On the Capital side (buildings and major plant), the University relies entirely upon an allocation from the loan funds made available to the State Government through the Loan Council. The Capital grant to the University for the year was £650,000, and there was a balance brought forward of £67,342. The Colonial Treasurer, when informing the University early in the financial year of this grant, indicated that it would be prudent for the University in the forthcoming financial year (1956/57) to plan its Capital expenditure so that it would not exceed £600,000. The total Capital expenditure of the University from 1st July, 1949, to 30th June, 1956, has been £3,297,716 and while this year's grant and the forecasted Capital grant are slightly in excess of the yearly average, regard must be had for the effect of steeply increasing costs for building and major plant. It is clear that, unless a substantial increment of Capital moneys is to be gained from other sources, a Capital grant from State loan sources will be insufficient to sustain the planned rate of development of the University at Kensington and other centres.

The Council at its first meeting in the forthcoming financial year will consider a report from the Vice-Chancellor surveying its Capital expenditure over the next ten years.

The University fully appreciates that the pattern of State public finance and the vicissitude of revenue raising preclude the State Government guaranteeing the University a yearly income over any span of years and wishes to record its appreciation of the understanding of our problems by the present Government and the financial and other support of a very high order it has extended to the University.
The Council.

At the Council meeting held on 11th July, 1955, Mr. Wallace C. Wurth, C.M.G., LL.B., was re-elected Chancellor of the University for the ensuing term of two years.

On 1st July, 1955, in accordance with the provisions of the Technical Education and New South Wales University of Technology Act, 1949-1955, governing the appointment of members of Council, Messrs. J. N. Barrett and R. C. Gibson were appointed to the Council as the representatives of agricultural, pastoral and rural interests. Mr. Barrett, a grazier, is the Secretary of the Northern Division of the Wheatgrowers' Union of New South Wales, and Mr. Gibson is the General President of the Primary Producers' Union.

At its meeting of 14th November, 1955, Council accepted with regret the resignation from the Council of Mr. J. N. Kirby. Mr. Kirby, who had been a member of the Developmental Council, and was a member of the University Council since its constitution by Act of Parliament in July, 1949, resigned because of increasing pressure of business commitments. Council recorded its appreciation of the service given to the University by Mr. Kirby. The vacancy on the Council caused by Mr. Kirby's resignation was filled with the appointment of Engineer-Captain G. I. D. Hutcheson, B.E., M.I.E.Aust., M.I.N.A., M.I.Mar.E., Managing Director, Cockatoo Docks and Engineering Co. Pty. Ltd. Engineer-Captain Hutcheson was appointed on 12th March, 1956.

During the year two members of Council were honoured by Her Majesty the Queen. Professor S. H. Roberts was appointed Companion of the Order of St. Michael and St. George, and Mr. R. J. Webster was appointed Commander of the Order of the British Empire.

The Council held five ordinary meetings and three special meetings during the year. Membership of Council and the attendances at meetings are set out in Appendix I.

A list of the Committees of Council and their membership is contained in Appendix II.

Advisory Panels.

At its meeting on 14th November, 1955, Council reviewed the membership of the University's Advisory Panels. Appointments and reappointments were made effective to 31st December, 1957. An Applied Psychology Advisory Panel was constituted by Council on 12th March, 1956.

Meetings of the Advisory Panels related to University courses were held on the dates shown hereunder:—

Applied Chemistry and Chemical Engineering Advisory Panel—


Enrolments.

Details of enrolments for 1956 are as shown hereunder—

Day Degree Courses.

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<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
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*Includes one student not proceeding to a degree.
Conversion Courses.

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* Diploma course only.
† These courses lead to a degree and do not qualify for the Diploma of Associateship of Sydney Technical College.
Instruction in degree courses was provided at Sydney, Newcastle, Wollongong and Orange, and in diploma courses at Sydney, Newcastle, Wollongong, Broken Hill and Lithgow.

**Higher Degree Courses.**

- Master of Science: 100
- Master of Engineering: 61
- Master of Architecture: 5
- Doctor of Philosophy: 72

Total: 238

**Arts Courses (Newcastle University College).**

One hundred and ninety-three 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.

**Graduate and Special Courses.**

Enrolments in graduate and special courses conducted by the various Schools of the University during the year totalled 646. A list of these courses is given on pages 481 and 482 of this report.

**Scholarships, Bursaries and Fellowships.**

The Council gratefully acknowledges the following Scholarships, Bursaries and Fellowships which have been made available during the year:

- Six Australian Atomic Energy Commission Research Studentships.
- Four Australian Atomic Energy Commission Undergraduate Scholarships.
- Two Australian Coal Association (Research) Ltd. Scholarships.
- The Imperial Chemical Industries of Australia and New Zealand Research Fellowship.
- The John Heine Memorial Scholarship.
- Eight Joint Coal Board Scholarships.
- Two Mining and Metallurgical Bursaries Fund Scholarships.
- The Monsanto Research Scholarship.
- Two Wool Industry Fund Scholarships.
- Forty-six Teachers' College Scholarships.
- Thirty-nine Technical Education Scholarships.
Seven Public Bursaries.

Nine Public Exhibitions.

Five hundred and seventeen Commonwealth Scholarships.

Particulars of these awards are given in Appendix III.

Ceremony for Conferring of Degrees and Open Day Held at Kensington, 14th April, 1956.

At a colourful ceremony held in the University grounds on 14th April, 1956, before an assembly of 1,500 people, the Chancellor admitted 131 candidates to their degrees. Ten candidates were admitted to the degree of Doctor of Philosophy, eleven to the degree of Master of Science, and one to the degree of Master of Architecture, the first occasion on which this degree has been awarded by the University. From the Faculty of Science fifty students were awarded the degree of Bachelor of Science, and four, the degree of Bachelor of Science (Optometrical Science). Fifty-three students were admitted to the degree of Bachelor of Engineering, and two to the degree of Bachelor of Architecture.


A list of recipients of degrees is given in Appendix IV.

After the Ceremony an Open Day was held at Kensington when the Schools of the University were open for inspection to members of the public. Demonstrations of scientific and mechanical equipment were given by students and members of the staff, and a programme of scientific films was screened in the theatre in the main building. The occasion aroused considerable interest, over 2,000 visitors being present.

Newcastle University College.

The Newcastle University College held its third Graduation Ceremony on 23rd March, 1956, the Chancellor presiding. Degrees were conferred by the Deputy Chancellor on thirteen students of the College, one being admitted to the degree of Master of Science, six to the degree of Bachelor of Science, and six to the degree of Bachelor of Engineering. The Honourable R. J. Heffron, M.L.A., delivered the Occasional Address. A list of students awarded degrees at the Ceremony is contained in Appendix IV to this report.
At the Ceremony the recently instituted Helmore Prize in French and Wheeler Prizes in History were awarded to three students in the Department of Arts, and the Geographical Society of New South Wales (Newcastle Branch) Prize in Geography was also awarded.

The number of subjects offered in 1956 for the Arts courses conducted by the College for the degree of Bachelor of Arts of the University of New England was again increased. Third-year courses are now offered in nine subjects, these being English, French, German, History, Philosophy, Psychology, Economics, Mathematics and Geography, and a second year is offered in Latin and in Education. Enrolments in Arts courses in 1956 increased to 193 from the 1955 figure of 135. In March, 1956, Council determined that annual fees payable for Honours courses in the Department of Arts should be an additional £9 per subject in years II and III, and that the fee in year IV should be £30 per subject.

Further accommodation was provided at the College with the completion of the additions to the John Darling building and the two-story wing on the Electrical Trades building. The first section of this new wing was occupied by the Department of Arts at the beginning of third term, 1955. The Department occupied the second section during first term, 1956. An extensive programme of ground improvements was undertaken in conjunction with the Department of Technical Education.

In 1956 the College again offered full-time and part-time instruction in the various Science and Engineering courses and a part-time course in Architecture. Full-time enrolments in these courses increased to 61 from the 1955 figure of 34, and part-time enrolments increased from 322 to 325. The total number of registered students enrolled at Newcastle in 1956 is 626.

Details of enrolments are set out hereunder. These figures are included in the general enrolment figures given on pages 470 to 472.

Applied Science, Engineering and Architecture.

Day Degree Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Enrolments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>15</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>General Science</td>
<td>24</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>14</td>
</tr>
<tr>
<td>Mining Engineering</td>
<td>1</td>
</tr>
</tbody>
</table>

Total: 61
### Part-time Degree and Diploma Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Chemistry</td>
<td>26</td>
</tr>
<tr>
<td>Applied Geology</td>
<td>4</td>
</tr>
<tr>
<td>Architecture</td>
<td>22</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>23</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>28</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>31</td>
</tr>
<tr>
<td>General Science</td>
<td>7</td>
</tr>
<tr>
<td>Industrial Chemistry</td>
<td>11</td>
</tr>
<tr>
<td>Manual Arts</td>
<td>13</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>96</td>
</tr>
<tr>
<td>Metallurgy</td>
<td>46</td>
</tr>
<tr>
<td>Miscellaneous Subjects</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>325</td>
</tr>
</tbody>
</table>

### Conversion Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Chemistry</td>
<td>7</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>6</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Metallurgy</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>29</td>
</tr>
</tbody>
</table>

### Higher Degrees:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Science</td>
<td>10</td>
</tr>
<tr>
<td>Master of Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18</td>
</tr>
</tbody>
</table>

### Arts Courses.

One hundred and ninety-three students (day and evening) are enrolled in Arts Courses at Newcastle University College.

The College has been assisted by the guidance of the Newcastle University College Advisory Committee. The Committee held two meetings during the year, on 6th December, 1955, and 23rd March, 1956.

### Reorganisation of Faculties.

The structure of the University’s faculty organisation has been under review during the year, and it was decided that from 1st June, 1956, the number of faculties should be increased to six by the
establishment of the Faculty of Technology. It was considered that the regrouping of the Schools and the setting up of the additional faculty would facilitate the administration of the faculties, and would enable closer co-operation between the Schools directly concerned with technologies in rapidly developing fields, such as fuel, paint, plastics, rubber and ceramics, and nuclear technology.

The revised composition of the faculties is as follows:

*Faculty of Applied Science:*
  - School of Applied Chemistry.
  - School of Applied Physics.
  - School of Mathematics.

*Faculty of Engineering:*
  - School of Civil Engineering.
  - School of Electrical Engineering.
  - School of Mechanical Engineering.

*Faculty of Technology:*
  - School of Chemical Engineering.
  - School of Metallurgy.
  - School of Mining Engineering and Applied Geology.
  - School of Textile Technology.
  - School of Wool Technology.

*Faculty of Architecture:*
  - School of Architecture and Building.

*Faculty of Commerce:*
  - School of Accountancy.
  - School of Economics.
  - School of Hospital Administration.

*Faculty of Humanities and Social Sciences:*
  - School of Humanities and Social Sciences.
  - School of Applied Psychology.
  - Department of Arts, Newcastle University College.

**Senior Staff.**

The Vice-Chancellor, Professor J. P. Baxter, was granted leave of absence by the Council from 26th July to 14th October, 1955, to lead the Australian delegation to the Atoms for Peace Conference held at Geneva. During his visit overseas Professor Baxter conferred with the Atomic Energy authorities of Britain, the United States and Canada, where he discussed the latest developments in atomic energy research and application.
On 14th November, 1955, the Council approved the creation of the senior administrative position of Pro-Vice-Chancellor, to which Professor D. W. Phillips, Head of the School of Mining Engineering and Applied Geology, was appointed. The Council also approved the appointment of Professor Phillips, who had been Dean of the Faculty of Engineering, as Dean of the new Faculty of Technology and of Professor A. H. Willis as Dean of the Faculty of Engineering. The appointment of Professor R. M. Hartwell as Dean of the Faculty of Humanities and Social Sciences was also approved. The appointments were for varying periods, terminating on 30th June, 1956.

Professor A. H. Willis, Head of the School of Mechanical Engineering, during the period 24th September to 18th November, 1955 attended the World Symposium on Applied Solar Energy held at Tuscon and Phoenix in Arizona, U.S.A., and investigated the latest developments in Agricultural Engineering in the United States and England.

Dr. S. J. Angyal, Associate Professor of Organic Chemistry, was granted five weeks' leave to take part in the proceedings of the XIVth International Congress of the International Union of Pure and Applied Chemistry, held in July, 1955, at Zurich.

By leave of Council, Professor P. R. McMahon, Head of the School of Wool Technology, spent the period December, 1955 to July, 1956 in India. Professor McMahon was engaged on work on behalf of the Government of India at the request of the Food and Agriculture Organization of the United Nations.

Appointments to Professorial staff during the period under review were as follows:—

**Professor of Textile Technology:**

**Professor of Accountancy:**

**Professor of Inorganic Chemistry:**

**Nuffield Research Professor of Mechanical Engineering:**

**Professor of Economics:**
D. C. Rowan, B.A. (Econ.) Bristol, 24th May, 1956.
Associate Professor of Textile Technology:

Associate Professor of Chemical Engineering:


In May, 1956, Council approved the establishment of the position of Deputy Registrar of the University.

Other appointments to Senior Staff during the period under review were:

Senior Lecturer in Mechanical Engineering:

Senior Lecturer in Physics:

Senior Lecturer in Electrical Engineering:

Senior Lecturer in Mathematics:

Senior Lecturer in Civil Engineering:

Senior Lecturer in Electrical Engineering:

Senior Lecturer in Chemical Engineering:

Senior Lecturer in Architecture:

Senior Lecturer in Electrical Engineering:
Senior Lecturer in Chemistry:


Senior Lecturer in History:


Dr. G. A. Cranfield, B.A., Ph.D., Cantab., Senior Lecturer in History, transferred to a similar position at the Newcastle University College with effect from 20th February, 1956; and Mr. S. E. Bonamy, B.E. Syd., A.S.T.C., A.M.I.E.Aust., Senior Lecturer in Mechanical Engineering, transferred to a similar position with the University Division of the Wollongong Technical College with effect from 20th February, 1956.

On the 5th September, 1955, Mr. G. Caiger took up duties as Public Relations Officer of the University.

During the year under review study leave was approved for the following members of staff for the periods indicated:—

F. L. Connors, Senior Lecturer in Chemical Engineering—one year from August, 1955.

S. C. Baker, Senior Lecturer in Physics, Newcastle University College—one year from August, 1955.

R. G. Geering, Lecturer in English—one year from January, 1956.

J. Munro, Senior Lecturer in Mechanical Engineering—one year from May, 1956.

P. S. Barna, Senior Lecturer in Mechanical Engineering—one year from June, 1956.

Professor J. J. Auchmuty, Professor of History, Newcastle University College—six months from August, 1956.

G. J. Haggarty, Senior Lecturer in Civil Engineering, Newcastle University College—one year from August, 1956.

C. A. Stapleton, Lecturer in Electrical Engineering—one year from August, 1956.

F. Gutmann, Senior Lecturer in Chemistry—seven months from October, 1956.

J. R. A. Anderson, Senior Lecturer in Chemistry—one year from December, 1956.

E. R. Cole, Senior Lecturer in Chemistry—one year from December, 1956.

S. E. Livingstone, Lecturer in Chemistry—one year from December, 1956.

L. W. O. Martin, Senior Lecturer in Chemistry—one year from February, 1957.
At the request of U.N.E.S.C.O., Council granted one year's leave of absence from October, 1955, to Mr. H. E. Wulf, Lecturer in Mechanical Engineering, to act as an advisor on Technical Education to the Government of Laos.

Other members of staff on study leave during the year, whose leave was approved in an earlier period, were—

S. E. Bonamy, Senior Lecturer in Mechanical Engineering.
N. R. Davies, Senior Lecturer in Chemistry.
G. C. Dewsnap, Senior Lecturer in Electrical Engineering.
J. F. McConnell, Senior Lecturer in Physics.
G. H. Roper, Senior Lecturer in Chemical Engineering.
G. Shaw, Senior Lecturer in Chemistry.
P. Spooner, Senior Lecturer in Architecture.
H. J. Brettle, Supervising Lecturer in Civil Engineering.
A. F. Nettleton, Supervising Lecturer in Civil Engineering.
G. A. Barclay, Lecturer in Chemistry.
P. Beckman, Lecturer in Chemistry.
L. O. Bowen, Lecturer in Physics.
D. J. Cole, Lecturer in Electrical Engineering.
W. J. Dunstan, Lecturer in Chemistry.

Courses of Study.

During the year appointments were made to the Foundation Chairs in Accountancy, Economics and Textile Technology. Planning of courses in Accountancy and General Commerce leading to the degree of Bachelor of Commerce, and in Textile Technology leading to the degree of Bachelor of Science, is now well advanced. These courses should be available to students in the 1957 academic year. In March, 1956, appointments were made to the Chairs of Highway Engineering and Traffic Engineering. The Professors will take up their appointments shortly. At the meeting held in July, 1955, Council approved in principle the establishment of a Chair in Fuel Technology and consideration was also given to the institution of courses in Rubber and Plastics Technology, Paint Technology, and Industrial Ceramics. Following a generous grant by the Kellogg Foundation, Council approved the institution of a post-graduate course in Hospital Administration and the establishment of a Chair in this subject within the University.
During 1956 the Accountancy diploma course, leading to the award of Associateship of Sydney Technical College, is being conducted by the Faculty of Commerce.

A number of the University's courses were revised during 1955. The Electrical Engineering full-time degree course now offers fourth-year specialisations in Power Apparatus and Systems, Utilization and Control, and Communications, and the revised syllabus for the part-time degree course in Applied Biology provides for Honours in Entomology in addition to Microbiology and Biochemistry. The general revisions to the Mining Engineering and the Applied Geology degree courses, as approved by Council in March, 1956, operated from the first term of 1956.

Instruction in physics given to students in the various Schools of the University was revised to provide, wherever possible, a common syllabus for all undergraduate courses. Revisions were also made in the Mechanical Engineering Conversion course, the Metalliferous Mining Engineering diploma course given at Broken Hill, and a number of minor revisions were made in other courses.

Council gave its approval in November, 1955, to alterations in the conditions for the award of the degree of Master of Science. Under the revised conditions students holding a first degree at pass standard may, in certain circumstances, be admitted as candidates for the degree of Master.

A post-graduate course in Automatic Control given by the School of Electrical Engineering and designed to extend over two years commenced in the first term, 1956. This course may be taken as part requirement for the degree of Master of Engineering.

Approval was given in May to the provision of a course of fifteen lectures in Reactor Engineering. This course, which will commence in August, is the first one to be given by the University's recently established Institute for Nuclear Engineering.

The graduate and special courses conducted during the year by the University again proved popular, and total enrolments in the eighteen courses given numbered 646. A list of these courses follows:

**School of Applied Chemistry:**
- Elementary Marine Biology.
- Recent Advances in Fermentation Processes.
- Statistical Methods Applied to Chemical Problems.
- Theory and Applications of Chromatography (2nd course).

**School of Applied Psychology:**
- Child Development.
- Projective Techniques.

*5112—16 K6137*
School of Chemical Engineering:
Chemical Engineering Unit Operations—Crystallisation, Filtration, Centrifuging and Drying.
Elements of Food Technology—Canning Part I.
Paint Technology.
Paper and Paperboard—Applications in Food Packaging.

School of Civil Engineering:
Advanced Surveying, Astronomy and Geodesy.
Prestressed Concrete Design.
Structural Analysis.

School of Electrical Engineering:
Post-graduate Course in Automatic Control:
  Feedback Control Systems I.
  Analogue Computers.
  Advanced Mathematics.
  Television (2nd course).

School of Mathematics:
Statistical Methods in Experimental Design, Part II.

School of Wool Technology:
Special Lectures for the Wool Industry.
Special Lectures for Wool Producers.

Research.

The Council is pleased to report that the research activities of the Schools have been further extended during the year. In addition to conducting long-term research projects on fundamental problems, the University has continued its policy of undertaking particular investigations at the request of industrial concerns and Government departments.

With the institution of the Water Research Foundation, important work is commencing in the field of water engineering, and the Institute for Nuclear Engineering is sponsoring projects of basic importance in various Schools of the University. Detailed reference to these two bodies is made below.

This year the number of candidates engaged on higher degree research has increased to 238. A list of research projects, including higher degree studies and publications by members of the University, is set out in Appendix V to this report.
The Institute for Nuclear Engineering.

The Institute for Nuclear Engineering, established within the University by Council at its meeting on 10th May, 1954, has been active throughout the year. To supervise the development of the Institute, a Committee has been formed with the following membership:

J. P. Baxter, Vice-Chancellor, Professor of Chemical Engineering (Chairman).
D. W. Phillips, Professor of Mining Engineering and Applied Geology.
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.

The Institute is carrying out its function of developing and encouraging research in the various fields of Nuclear Engineering by initiating research projects within the existing Schools of the University.

The School of Chemical Engineering has obtained a 1000 curie, Cobalt 60, gamma ray source from the British Atomic Energy Authority. This will be used for training engineers in the handling of radioactive materials, for research into the preservation of foodstuffs by radiation, and for research into the effects of gamma radiation on materials, chemical reactions, etc.

The School of Metallurgy has been engaged on a study of various reactive metals, such as zirconium, titanium, uranium and thorium. One early result of the School's work was the preparation, for the first time in this country, of a sample of pure uranium made from Australian ores.

The field of Radio Chemistry is being studied by the School of Applied Chemistry, and plans have been completed for the construction of a Radio Chemistry laboratory in the main building at Kensington.

Members of the staff of the School of Mining Engineering and Applied Geology have been active in uranium prospecting in this country, and investigations of various processes for the treating of uranium ore are being carried out.
In the School of Electrical Engineering, a simple nuclear reactor simulator which reproduces the behaviour of a basic reactor system has been constructed. A much larger instrument, intended primarily for the training of reactor engineers, has been designed. The School is also installing a modern Digital Computer, to be known as UTECOM, which will be used, among other purposes, for solving problems in nuclear reactor design. The computer was purchased from funds provided out of the New South Wales Government grant of £125,000, made in August, 1954, to support research in nuclear engineering.

In addition to the extensive research programme, the Institute plans to provide courses of instruction at graduate level on various aspects of Nuclear Engineering. These courses will be designed to acquaint practising scientists and technologists with developments in this field, and the courses may also be taken as part requirement for a higher degree. The first course to be given by the Institute, "An Introductory Course in Reactor Engineering", will commence in August and will consist of fifteen lectures given by Professor J. P. Baxter and Professor L. C. Woods.

Symposium on Water Resources of Australia.

The University held its second public Symposium in the main building at Kensington on the 29th and 30th of November, 1955. The Symposium, on "The Water Resources of Australia—Their Control and Development", was officially opened by the Governor of New South Wales, Lieut.-General Sir John Northcott, before an audience of more than 200 scientists, engineers and representatives of Industry.

Papers on various aspects of the control and development of Australia’s water resources were given by Mr. J. A. Aird, Commissioner, State Rivers and Water Supply Commission, Victoria; Mr. J. W. Whiting, Acting Government Geologist, New South Wales Department of Mines; Mr. E. S. Clayton, Commissioner, Soil Conservation Service, New South Wales; Mr. R. A. Young, Commissioner, New South Wales Water Conservation and Irrigation Commission; Dr. E. G. Bowen, Chief of Division of Radiophysics, C.S.I.R.O.; Sir William Hudson, Commissioner, Snowy Mountains Hydro-Electric Authority; and from this University, by Professor J. P. Baxter, Professor C. H. Munro and Mr. H. R. Vallentine.

A booklet containing the papers presented at the Symposium has been published by the University and offered for sale. The demand for the booklet has been most encouraging, several hundred copies having been sold.
At the Symposium the speakers emphasised the importance of research into Australia's water resources and pointed out the need for increased scientific activity in this field. Practical recognition of this need was shown with the announcement at the Symposium of the formation of the Water Research Foundation. Mr. Jack G. Beale, M.L.A., in an address to the gathering, explained the purpose of the Foundation and called for public support of its work.

Professor C. H. Munro, Head of the School of Civil Engineering in this University, has been appointed a member of the Committee and Director of Research of the Foundation, and Mr. C. J. Weisner, Senior Lecturer in Civil Engineering, has been appointed Secretary of the Foundation and Secretary of its Research Committee.

Recognition of Degrees and Diplomas by Professional Institutions.

During the year several of the University's degree and diploma courses were given further recognition by professional institutions.

In February, 1956, advice was received from the Institution of Electrical Engineers, London, that the Electrical Engineering degree courses have been accepted as granting exemption from the examination requirements for associate membership of the Institution. The diploma courses in Electrical and Radio Engineering have been accepted as exempting from Parts I and II of the Institution's examination.

The Royal Institute of British Architects, London, has accepted the Architecture degree and diploma courses as meeting the academic requirements for admission to associate membership of that organization, and negotiations concerning the recognition of other courses are now proceeding with certain Australian and overseas professional institutions.

Impulse Generator for School of Electrical Engineering.

The School of Electrical Engineering is constructing a 2.1 million volt impulse generator to be used for the testing of high voltage equipment. The generator, which will have the highest voltage and capacity of any in Australia, will be made up of twelve stages each of 175,000 kilo-volts with a stage capacitance of approximately 0.15 micro-farads. The generator will be mounted on a trolley and will thus have the advantage of being mobile.

Visit of Commonwealth Inter-University Conference Delegates.

Nine of the delegates to the Commonwealth Inter-University Conference held in Melbourne during August of 1955 were entertained at a dinner given by the Chancellor and Council on 24th August. The dinner was also attended by the Premier, the Minister for Education,
and members of the professorial staff. On the following day the delegates met the members of the Professorial Board and attended a seminar at which the objectives and development of the University were discussed.

**Meeting of the Australian Vice-Chancellors' Committee.**

A meeting of the Australian Vice-Chancellors' Committee was held at Kensington from 19th to 21st October, 1955. A buffet luncheon was arranged on the first day when members of Council had the opportunity of meeting the Vice-Chancellors from other Australian Universities.

**Development of University Site at Kensington.**

During the year considerable advances were made in the building programme of the University at Kensington. Work is now well advanced on the construction of the first of a group of five buildings to accommodate the Faculty of Applied Science. This building, 228 ft. long and 43 ft. 10 in. wide, will be a three-storied structure with a reinforced concrete frame and aluminium and glass curtain walls. The reinforced concrete footings and beams of the ground floor are complete and the precast concrete troughing beams, which are being made off the site, will be ready to be placed in position shortly. Detailed plans and estimates for the construction of the Main Hall, which is included in the Applied Science group, were approved by Council in March, 1956.

In September, 1955, Council approved of the erection of a single-storey building of monocrete multicast construction to accommodate the Faculty of Commerce and the Schools of Mathematics and Applied Psychology. The building, situated on the western side of Anzac Parade, was occupied in May, 1956, and work is continuing on the external paving and the laying out of the grounds. The 21,000 square feet of floor space contains five lecture rooms and three special purpose laboratories. Erection of a similar type of building on the corner of Day Avenue and Anzac Parade to provide classroom accommodation was approved by Council in May, 1956.

To meet the increasing need for space, Council approved of a plan to make the maximum use of the lower ground floor of the Main Building at Kensington. When complete an additional 19,000 square feet of floor space will be available to the University. The Department of Production Engineering has occupied part of this area from the first term, 1956. Provision has also been made for three classrooms and a laboratory for the School of Textile Technology and for workshops and laboratories for the School of Applied Physics. It is expected that these facilities will be ready for use for the first term in 1957. The University's Digital Computer, UTECOM, will shortly be installed in a section of this lower ground floor area.
On 4th April, 1956, a modern cafeteria was opened in the Main Building. The cafeteria, designed to seat 192 persons, provides meals throughout the year for Hostel residents, students and members of the staff.

Work has continued on the three steel framed aluminium buildings being erected for the Schools of Chemical, Electrical and Mechanical Engineering. The structural framework is complete with the exception of the tower of the Electrical Engineering building.

Temporary repairs to the roof of the Main Building, which was damaged in a severe storm on 10th June, 1956, have been completed, and recommendations submitted by the Government Architect for the permanent repair of the roof are under consideration.

Student Hostel.

In March, Council accepted a tender for the construction of the new Hostel building designed to accommodate 191 students.

The weekly tariff for board and lodging at the Hostel was increased from £3 10s. to £4 per week with effect from 20th February, 1956.

Training Depot for University of Technology Regiment.

At its March, 1956 meeting, Council gave its approval to the leasing to the Department of the Army, of an area of University land fronting Day Avenue, Kensington, for the purpose of establishing a training depot to meet the requirements of the University of Technology Regiment.

Graduate and Undergraduate Activities and Organizations.

The first issue of "Eutectic", the annual magazine of the Graduates' Association, was published in June, 1956. "Eutectic" contains reports from the various Schools and other items designed to keep graduates informed of developments within their University. The high standard set by previous issues of the "Engineering Yearbook" produced by the students of the Faculty of Engineering, was maintained in the 1954-55 issue published during the year. The issue for 1955-56 is now in the press. Seven lively issues of "Tharunka", the journal of the Students' Union, appeared during the year, and students availed themselves of its columns to voice their opinions on a wide range of topics.

In November, 1955, Council approved the Constitutions of the New South Wales University of Technology Mechanical Engineering Society and the N.S.W. University of Technology Wool Technology Association, and at the March, 1956 meeting approval was given to the Constitution of the University of Technology Students' Union of Wollongong. These three student organizations now have the status of recognised University Societies.
Student interest has been maintained in a wide variety of sporting, cultural and religious clubs, and a particularly pleasing feature of undergraduate life over the past year has been the continued participation of part-time students in the activities of these clubs.

The Drama Club staged four successful productions during the year including a presentation of G. Bernard Shaw's "The Devil's Disciple" in the University Theatre. This active organisation has a membership of fifty, drawn from students and members of the staff.

The University was well represented in the Inter-Varsity sporting competitions, entering teams in athletics, basketball, golf, rugby union football, boxing, weight lifting, rifle shooting, rowing, tennis and table tennis. Two championships, in table tennis and boxing, were won, and the general high standard of performance indicated that in the near future the University will be a strong force in Inter-Varsity sport. An oval on the main Kensington site is in course of preparation and when the ground has settled sufficiently the sporting clubs will have the use of it for practice and match play.

**Benefactions.**

Council acknowledges with gratitude the following benefactions which were received during the year:—

*Grant by W. K. Kellogg Foundation for Hospital Administration Course.*—The W. K. Kellogg Foundation has approved a grant to the University of £55,700 for the establishment of a Chair and post-graduate course in Hospital Administration. The grant will be spread over five years, and this year the Foundation has made available the sum of £14,000.

*Commonwealth Scientific and Industrial Research Organisation Grant.*—The Commonwealth Scientific and Industrial Research Organisation has made a further grant of £14,608 to the University for work on the following projects:—

- Studies on the composition of Australian fruits and fruit products;
- Wool research;
- Research on synthesis of organic phosphates for weed control;
- Research on control of the cattle tick;
- Research in colloid sciences;
- Research into the process of absorption dyes and detergents by wool;
- Research in agricultural engineering.
Donations to the Impulse Generator Fund.—Donations totalling £10,635 have been received from the following donors for the construction of an Impulse Generator for the School of Electrical Engineering:

Public Bodies:

- The Electricity Commission of N.S.W. £4,250
- Electric Light and Power Supply Corp. Ltd. £1,000
- Greater Wollongong City Council £250
- Mackellar County Council £250
- Newcastle City Council £750
- New South Wales Department of Railways £1,000
- Northern Rivers County Council £250
- St. George County Council £250
- Sydney County Council £2,000

Electrical Industries:

- Amalgamated Wireless (Australasia) Ltd. £50
- Australian Electrical Industries Pty. Ltd. £50
- British General Electric Co. Pty. Ltd. £50
- Cable Makers Australia Pty. Ltd. £100
- Crompton Parkinson (Australia) Pty. Ltd. £50
- D. E. Taplin Pty. Ltd. £10
- Don Electrical Pty. Ltd. £25
- Dux Heaters Pty. Ltd. £25
- Email Limited £100
- Johnson and Phillips (Australia) Pty. Ltd. £25
- Philips Electrical Industries Pty. Ltd. £100
- Standard-Waygood Ltd. £50

Australian Atomic Energy Commission Grants for Research.—The Australian Atomic Energy Commission has made available the sum of £7,000 for further research in the School of Chemical Engineering and the sum of £2,000 for the construction of a nuclear reactor simulator.

Australian Automobile Association Grant for Chair in Traffic Engineering.—A grant of £25,000 to be spread over a period of five years, has been made to the University by the Australian Automobile Association for the establishment of a Chair in Traffic Engineering. The Association has this year made available the sum of £10,000.
Department of Main Roads Grant for Chair in Highway Engineering.—The Department of Main Roads is granting the University the sum of £5,000 for five years to establish the Chair in Highway Engineering. The first annual grant of £5,000 was made by the Department this year.

Commonwealth Grant for Training of Colombo Plan Students.—The Commonwealth has made available the sum of £9,285 for the training of Colombo Plan students in the Department of Food Technology, and £2,500 for the training of other such students in assaying and prospecting in the School of Mining Engineering and Applied Geology.

Joint Coal Board Grants.—The Joint Coal Board has provided the sum of £9,558 to the University for the purchase of equipment for the School of Mining Engineering and Applied Geology. A further sum of £442 was received from the Board towards the cost of transporting a Deister coal washing table from the United States.

Nuffield Foundation Research Grants.—The Nuffield Foundation has made available a further sum of £3,125 towards the maintenance of the Nuffield Research Chair in Mechanical Engineering, and provided an additional £2,000 for research in the chemistry of inositols.

New South Wales State Cancer Council Research Grant.—A grant of £3,553 has been made by the New South Wales State Cancer Council for research in the chemistry of the nitrogen-hetero-cyclic compounds being conducted by the Departments of Organic Chemistry and Biological Sciences.

Commonwealth Bank of Australia Rural Credits Development Fund Grant.—A further grant of £1,150 was received from the Rural Credits Development Fund by the University for work on the following projects:

- Investigation of the chemistry of Australian ants;
- Research in relationship of rainfall and run-off;
- Improved design techniques for spray irrigation;
- Studies on the composition of Australian fruits and fruit products.

Rural Bank of New South Wales Grant.—The Rural Bank has made available the sum of £2,400 for research in agricultural engineering, and a further amount of £500 for an investigation of water problems in Australia.
Donations Towards Equipping Paint Technology Laboratory.—
Donations towards equipping the Paint Technology Laboratory in the School of Chemical Engineering were received from the following organisations:—

£ s. d.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>£</th>
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<tbody>
<tr>
<td>Henry H. York and Co. Pty. Ltd.</td>
<td>25 0 0</td>
</tr>
<tr>
<td>Hodgsons Dye Agencies Pty. Ltd.</td>
<td>5 5 0</td>
</tr>
<tr>
<td>James Barnes Pty. Ltd.</td>
<td>5 5 0</td>
</tr>
<tr>
<td>Lysaght Bros. and Co. Pty. Ltd.</td>
<td>10 10 0</td>
</tr>
<tr>
<td>Meggitt Ltd.</td>
<td>21 0 0</td>
</tr>
<tr>
<td>N.S.W. Paint Manufacturers’ Agreement</td>
<td>3,500 0 0</td>
</tr>
<tr>
<td>Reichhold Chemicals Inc. (Aust.) Pty. Ltd.</td>
<td>52 10 0</td>
</tr>
<tr>
<td>The Shell Co. of Australia Ltd.</td>
<td>50 0 0</td>
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</tbody>
</table>

Australian Association of Advertising Agencies Grant.—The Australian Association of Advertising Agencies has made available the sum of £1,200 towards the investigation into the educational needs of the advertising industry being conducted by the School of Applied Psychology.

Donations for Atmospheric Pollution Research Fellowships.—Donations towards the establishment of two research Fellowships in atmospheric pollution have been received from the following organisations:—

£

<table>
<thead>
<tr>
<th>Organisation</th>
<th>£</th>
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<tbody>
<tr>
<td>Australian Iron and Steel Ltd.</td>
<td>200</td>
</tr>
<tr>
<td>Broken Hill Pty. Co. Ltd.</td>
<td>200</td>
</tr>
<tr>
<td>Commonwealth Steel Co. Ltd.</td>
<td>100</td>
</tr>
<tr>
<td>Electricity Commission of New South Wales (per annum for five years)</td>
<td>733</td>
</tr>
<tr>
<td>Joint Coal Board per annum for three years</td>
<td>340</td>
</tr>
<tr>
<td>Lysaghts Works Pty. Ltd.</td>
<td>100</td>
</tr>
<tr>
<td>New South Wales Department of Railways</td>
<td>340</td>
</tr>
<tr>
<td>Rylands Bros. Australia Pty. Ltd.</td>
<td>50</td>
</tr>
<tr>
<td>Southern Portland Cement Ltd.</td>
<td>100</td>
</tr>
<tr>
<td>Stewarts and Lloyds (Australia) Pty. Ltd.</td>
<td>100</td>
</tr>
</tbody>
</table>

Australian Broadcasting Commission Board Grant.—The Australian Broadcasting Commission Board has provided the sum of £550 towards the pre-television social survey being carried out by the School of Applied Psychology.
Department of Commerce and Agriculture.—The Department of Commerce and Agriculture made available an amount of £500 towards the cost of a visit overseas by Professor A. H. Willis to investigate the latest developments in agricultural engineering.

Simon-Carves (Aust.) Pty. Ltd. Prize Fund.—A donation of £250 has been received from Simon-Carves (Aust.) Pty. Ltd. for the awarding of annual prizes in Chemical Engineering Unit Operations and Chemical Engineering Design.

H. L. Wheeler Prize Fund.—A donation of £510 has been made by Colonel and Mrs. H. L. Wheeler to endow the “Wheeler History Prizes” in the Department of Arts at the Newcastle University College.

B. A. Helmore Prize Fund.—Dr. Basil A. Helmore has made available £105 to endow the “Helmore French Prize” in the Department of Arts at the Newcastle University College.

Beetle Elliott Ltd. Grant.—A donation of £500 was made by Beetle Elliott Ltd. to the University’s special purposes fund.

Titan Pty. Ltd. Grant.—A grant of £175 has been received from Titan Pty. Ltd. for the physical testing of surgical gut in the Department of Physical Chemistry.

New South Wales Sheep Breeders’ Association Grant.—The New South Wales Sheep Breeders’ Association made available the sum of £84 18s. 0d. towards the cost of a series of lectures given by the School of Wool Technology at the Sheep Show held in Sydney in May and June, 1956.

Colonial Sugar Refining Co. Ltd. Grant.—The Colonial Sugar Refining Co. Ltd. donated £100 towards the cost of a visit from England of Dr. M. M. Davies, a noted Physical Chemist, who is undertaking work in the School of Applied Chemistry during 1956.

Andrew’s Laboratories Pty. Ltd. Grant.—A grant for £100 was made to the University by Andrew’s Laboratories Pty. Ltd. for the purchase of two van de Graaff generators for the School of Applied Chemistry.

Department of Public Works Grant.—The Department of Public Works has made available the sum of £100 for the installation of electric analogy apparatus in the School of Civil Engineering.
J. H. Liddle and Epstein Pty. Ltd. Grant.—A grant of £44 10s. 0d. has been made by J. H. Liddle and Epstein Pty. Ltd. towards the cost of instruments for the Department of Food Technology's Dehydrator.

New South Wales University of Technology Prize Fund.—The following donations to the New South Wales University of Technology Prize Fund were received during the year:

<table>
<thead>
<tr>
<th>Institution</th>
<th>£</th>
<th>s</th>
<th>d</th>
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<tbody>
<tr>
<td>Royal Australian Institute of Architects</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(N.S.W. Chapter)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hewlett Packard Co., Palo Alto, California</td>
<td>48</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>D. A. McLachlan, Maclac Products Pty. Ltd.</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Australian Institute of Builders</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>James Hardie and Co. Pty. Ltd.</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The Master Builders' Association of New South Wales</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Board of Architects of New South Wales</td>
<td>21</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mrs. J. M. Falls</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mr. H. G. Horsley</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Mr. F. W. Booker</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

Council also acknowledges with gratitude the donation to the Department of Food Technology of a can closing machine, valued at £1,800 by John Heine and Son Pty. Ltd., and the donation by the Deister Concentrator Company, U.S.A., of a Deister superduty diagonal deck coal washing table, valued at £1,012 to the School of Mining Engineering and Applied Geology.

Accounts.

Statements showing the position of the various funds of the University as at 30th June, 1956, 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—eight meetings.
Deputy Chancellor.
The Hon. John Sydney James Clancy, LL.B., Justice of the Supreme Court—eight meetings.

Vice-Chancellor.

Pro-Vice-Chancellor.

Members.
Frederick William Aysscough, B.Sc., A.R.I.C., A.R.A.C.I., Senior Lecturer in Chemical Engineering, New South Wales University of Technology—seven meetings.


James Noel Barrett, Grazier; Secretary, Northern Division, Wheatgrowers' Union of New South Wales. Appointed on 1st July, 1955—three meetings.


Robert Clarence Gibson, General President, Primary Producers' Union. Appointed on 1st July, 1955—six meetings.

The Hon. William McCulloch Gollan, M.L.A., Minister without Portfolio—four meetings.

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

Ronald Max Hartwell, M.A., Dip.Ed., D.Phil., Professor of Economic History, New South Wales University of Technology and Dean of the Faculty of Humanities and Social Sciences. Elected on 29th June, 1955—eight meetings.

Harry Fredrick Heath, B.A., B.Ec., Member, New South Wales Public Service Board—eight meetings.


William George Kett, F.S.M.C., F.I.O. (Lond.), Past President, Australian Optometrical Association; Director, Mark Foy's Ltd.—eight meetings.

The Hon. Robert Arthur King, M.L.C., Secretary, Labor Council of New South Wales—no meetings.*


Richard Godfrey Christian Parry-Okeden, Managing Director, Lysaghts Works Pty. Ltd.; Past President, Chamber of Manufactures of New South Wales—five meetings.


Arthur Alfred Robinson, M.B.S.I., Head of School of Footwear, New South Wales Department of Technical Education—five meetings.

Gregory Bede Thomas, LL.B., B.Sc., B.E., Barrister—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—five meetings.

John fell Dalrymple Wood, B.Sc., B.E., A.M.I.E Aust., Associate Professor of Mechanical Engineering, New South Wales University of Technology; President, New South Wales University of Technology Staff Association—seven meetings.


*During the year leave of absence from Council meetings for various periods was granted to Professor Roberts, Drs. Clegg, MacDougall and Wyndham, and to Messrs. Goodsell, King, Laurie and Mathews.

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. W. E. Clegg.
Mr. A. Denning.
Mr. J. W. Goodsell.
Mr. W. G. Kett.
Mr. W. R. Laurie.
Dr. J. K. MacDougall.
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. W. R. Laurie.
Professor R. H. Myers.
Mr. R. J. Webster.

Personnel Sub-Committee of the Executive Committee:
The Chancellor (Chairman).
The Deputy Chancellor.
The Vice-Chancellor.
Mr. W. G. Kett.

Academic Committee:
The Deputy Chancellor (Chairman)
The Vice-Chancellor
Dr. F. S. Bradhurst.
Mr. A. Denning.
Mr. H. R. Harant.
Mr. H. F. Heath.
Mr. W. G. Kett.
Mr. F. M. Mathews.
Professor R. H. Myers.
Professor D. W. Phillips.
Mr. G. B. Thomas.
Associate Professor J. F. D. Wood.
Dr. H. S. Wyndham.

Appeals Committee:
The Chancellor (Chairman).
The Deputy Chancellor.
Member of Council nominated by association representing staff members or member of Council nominated by appellant students.

Buildings and Equipment Committee:
Dr. W. E. Clegg (Chairman).
The Vice-Chancellor.
Mr. R. C. Gibson.
The Hon. W. M. Gollan.
Mr. H. F. Heath.
Engineer-Captain G. I. D. Hutcheson.
The Hon. R. A. King.
Mr. W. R. Laurie.
Dr. J. K. MacDougall.
Professor C. H. Munro.
Professor D. W. Phillips.
Mr. A. A. Robinson.

Library Committee:
Mr. W. G. Kett (Chairman).
The Vice-Chancellor.
Mr. L. S. Baker.
Professor R. M. Hartwell.
The Hon. J. J. Maloney.
Professor D. W. Phillips.
Mr. G. B. Thomas.

Public Relations Committee:
Mr. R. J. Webster (Chairman).
The Vice-Chancellor.
Mr. F. W. Ayscough.
Mr. J. N. Barrett.
Mr. H. G. Conde.
Engineer-Captain G. I. D. Hutcheson.
The Hon. J. J. Maloney.
Mr. F. M. Mathews.
Mr. R. G. C. Parry-Okeden.

Newcastle College Committee:
Dr. J. K. MacDougall (Chairman)
The Vice-Chancellor.
Dr. W. E. Clegg.
Mr. A. Denning.
Mr. R. G. C. Parry-Okeden.
Dr. H. S. Wyndham.
APPENDIX III.

Awards of Scholarships for 1956.

Scholarships during the period under review were held as set out hereunder:

**Australian Atomic Energy Commission Research Studentships.**
- L. A. Cambey—Doctor of Philosophy Candidate, School of Applied Physics.
- F. Lawson—Doctor of Philosophy Candidate, School of Metallurgy.
- G. G. Madgwick—Doctor of Philosophy Candidate, School of Chemical Engineering.
- B. G. Madden—Master of Science Candidate, School of Chemical Engineering.
- G. R. Wallwork—Master of Science Candidate, School of Metallurgy.
- Hanneke Waterman—Master of Science Candidate, School of Applied Chemistry.

**Australian Atomic Energy Commission Undergraduate Scholarships.**
- M. G. Buchhorn—second year, Metallurgy.
- G. B. Guest—third year, Metallurgy.
- N. R. McDonald—first year, Metallurgy.
- J. W. Kable—first year, Metallurgy.

**Australian Coal Association (Research) Ltd. Scholarships.**
- M. N. Booker—second year, Mining Engineering.
- N. F. Owers—third year, Mining Engineering.

**The Imperial Chemical Industries of Australia and New Zealand Fellowship.**
- J. W. F. Hitchon—Master of Science Candidate, School of Metallurgy.

**Joint Coal Board Scholarships.**
- T. W. Arnall—first year, Mining Engineering.
- J. F. Ashcroft—second year, Mining Engineering.
- J. L. Beatty—third year, Mining Engineering.
- E. M. Howells—second year, Mining Engineering.
- F. E. Jaggar—fourth year, Mining Engineering.
J. N. Kay—fourth year, Mining Engineering.
E. C. McDonald—third year, Mining Engineering.
J. Strang—first year, Mining Engineering.

The **Mining and Metallurgical Bursaries Fund Scholarships.**

D. J. H. Corderoy—second year, Metallurgy.
G. B. Guest—third year, Metallurgy.

The **Monsanto Research Scholarship.**
T. L. Judell—Doctor of Philosophy Candidate, School of Chemical Engineering.

The **John Heine Memorial Scholarship.**
W. J. Howard—Metallurgy conversion course.

The **Wool Industry Fund Scholarships.**
J. P. Kennedy—fourth year, Wool Technology.
R. B. Whan—second year, Wool Technology.

**Bursaries and Exhibitions.**

M. G. Bonner—first year, Mechanical Engineering.
A. J. Morton—first year, Metallurgy.
Rosemary S. Babbage—second year, Arts (Newcastle University College).
D. A. March—first year, Arts (Newcastle University College).
L. A. Glendhill—second year, Arts (Newcastle University College).
D. C. Laycock—third year, Arts (Newcastle University College).
J. H. Watson—fourth year, Mechanical Engineering (Newcastle University College).

**Exhibitions.**

Y. P. Chen—first year, Chemical Engineering.
W. N. Neville—second year, Mechanical Engineering.

**Technical Education Scholarships.**

**Part-time Degree and Diploma Students.**

K. H. Bashford—first year, Electrical Engineering.
C. A. Brandon—first year, Aeronautical Engineering.
Technical Education Scholarships.

Part-time Degree and Diploma Students—continued:

K. M. Brieger—sixth year, Chemical Engineering.
N. E. Brock—second year, Electrical Engineering (Newcastle University College).
W. S. Burnett—second year, Electrical Engineering.
C. W. Carle—sixth year, Architecture.
P. J. Carroll—second year, Electrical Engineering.
J. Cox—first year, Electrical Engineering.
J. Crawford—fifth year, Chemical Engineering (Newcastle University College).
D. B. Dobbie—first year, Mechanical Engineering.
K. W. Doyle—first year, Electrical Engineering.
L. E. Engel—second year, Electrical Engineering.
R. L. Filmer—third year, Mechanical Engineering.
D. H. Hammond—second year, Optometry.
E. A. C. Harper—fifth year, Civil Engineering.
A. E. Hendry—fourth year, Electrical Engineering.
K. J. Hope—first year, Naval Architecture.
R. E. Humphry—first year, Electrical Engineering.
J. K. Jones—fifth year, Civil Engineering.
L. P. Kavanagh—second year, Mechanical Engineering.
R. H. Kennett—fifth year, Physics.
T. J. Ling—fifth year, Radio Engineering.
B. F. McBride—third year, Electrical Engineering.
A. J. McKean—fifth year, Electrical Engineering.
E. L. Perrin—first year, Electrical Engineering (Newcastle University College).
J. B. F. Pidcock—first year, Civil Engineering.
W. H. Reid—fifth year, Electrical Engineering.
R. C. Reynolds—fifth year, Electrical Engineering.
D. H. Rogers—fifth year, Civil Engineering.
W. N. Roebuck—fourth year, Electrical Engineering.
H. Saywell—fifth year, Mechanical Engineering.
R. H. Smith—first year, Mechanical Engineering.
K. Stephens—first year, Electrical Engineering.
R. M. Uebel—fourth year, Electrical Engineering.
D. G. Wallis—first year, Mechanical Engineering.
Judith A. Waltho—third year, Applied Biology.
M. J. Way—fourth year, Electrical Engineering.
L. Young—second year, Radio Engineering.
Teachers' College Scholarships.

Newcastle University College:

J. R. Atherton—first year, Arts.
K. V. Barnett—third year, General Science.
Judith C. Bullerwell—first year, Arts.
E. J. Braggett—second year, Arts.
T. V. Casey—first year, General Science.
M. J. Cotterill—third year, General Science.
P. J. Clarke—second year, Arts.
M. O. Davies—second year, General Science.
W. P. Driscoll—third year, Arts.
K. J. Ellis—first year, Arts.
Robyn A. Ellicott—first year, Arts.
J. J. Geary—first year, Arts.
J. Gill—third year, Arts.
D. Horsfield—second year, Arts.
W. N. Hall—first year, General Science.
C. J. Hawkins—first year, General Science.
M. A. Hennessy—second year, Arts.
G. W. Johnson—first year, General Science.
R. A. Kelly—first year, Arts.
M. M. Kennedy—second year, Arts.
V. Liuga—second year, Arts.
P. M. Logue—second year, Arts.
B. B. Lloyd—first year, General Science.
K. M. Majoribanks—first year, General Science.
P. A. McLean—second year, Arts.
J. D. McMahon—first year, Arts.
G. F. Nixon—second year, Arts.
Marianne A. O'Donnell—first year, Arts.
P. G. O'Shea—first year, Arts.
J. M. Quinn—first year, Arts.
Anne D. Renwick—third year, Arts.
G. M. Rogers—second year, General Science.
L. R. Robinson—third year, Arts.
R. Robinson—second year, Arts.
G. M. Stephens—third year, General Science.
G. H. Simpson—third year, Arts.
N. B. Thomas—second year, Arts.
B. E. Williams—second year, General Science.
L. Williams—second year, General Science.
Teachers' College Scholarships—continued.

M. J. Wann—second year, Arts.
H. E. White—first year, General Science.

Commonwealth Scholarships.

Full-time Degree Students:

A. G. Alleyn—first year, Metallurgy.
J. M. Anderson—first year, Applied Chemistry.
S. H. Baker—second year, Civil Engineering.
G. Baluk—second year, Chemical Engineering.
W. E. Bamford—second year, Civil Engineering.
C. R. Barker—first year, Electrical Engineering.
T. S. Barwood—first year, Civil Engineering.
R. J. Baxter—fourth year, Mechanical Engineering.
P. W. Beer—first year, Civil Engineering.
S. E. Behne—fourth year, Architecture.
G. Berzins—first year, Electrical Engineering.
A. J. Birzulis—second year, Civil Engineering.
E. W. Bishop—first year, Mechanical Engineering.
M. A. Boland—second year, Civil Engineering.
M. S. Bonner—first year, Mechanical Engineering.
A. S. Bowman—third year, Mechanical Engineering.
A. F. Boyle—third year, Electrical Engineering.
C. J. Brady—fourth year, Mechanical Engineering.
K. Brady—second year, Architecture.
H. D. Brodie—third year, Civil Engineering.
C. L. Campbell—second year, Electrical Engineering.
P. Carters—second year, Mechanical Engineering.
G. J. Celitans—second year, Applied Chemistry.
R. H. Chapman—third year, Civil Engineering.
K. G. Clancy—fourth year, Civil Engineering.
P. W. Clayton—second year, Civil Engineering.
H. A. Cohen—first year, Chemical Engineering.
A. F. Collings—second year, Chemical Engineering.
P. M. Collins—fourth year, Mechanical Engineering.
J. S. Colman—fifth year, Architecture.
B. Corderoy—second year, Electrical Engineering.
D. J. H. Corderoy—second year, Metallurgy.
N. K. A. Cox—third year, Mechanical Engineering.
A. A. Cram—first year, Civil Engineering.
Full-time Degree Students—continued:

C. J. Cripps-Clarke—third year, Metallurgy.
B. M. Croker—second year, Civil Engineering.
J. E. Davies—second year, Applied Chemistry.
L. Davies—first year, Applied Chemistry.
B. K. Davis—third year, Wool Technology.
J. A. Deall—first year, Mechanical Engineering.
H. W. Diehl—third year, Metallurgy.
M. R. Domars—first year, Applied Chemistry.
R. W. Doyle—fourth year, Wool Technology.
D. A. Drake—third year, Electrical Engineering.
K. J. Drake—first year, Applied Chemistry.
R. B. Dunn—second year, Architecture.
J. Eastwood—first year, Mechanical Engineering.
B. S. Ellis—fourth year, Architecture.
R. J. Enright—third year, Mechanical Engineering.
I. T. Ernst—first year, Applied Chemistry.
K. Falk—second year, Architecture.
R. G. Farrell—second year, Mechanical Engineering.
B. P. Felkens—first year, Electrical Engineering.
L. E. Fennell—fourth year, Electrical Engineering.
A. M. Forster—first year, Electrical Engineering.
R. G. Fraser—first year, Architecture.
G. J. French—first year, Architecture.
G. G. Fuller—fourth year, Architecture.
J. A. Gilmour—first year, Metallurgy.
D. G. Graham—third year, Electrical Engineering.
T. J. Grainger—third year, Wool Technology.
N. E. Griffiths—second year, Civil Engineering.
D. T. Hanly—second year, Architecture.
R. J. Hart—third year, Wool Technology.
J. W. Hayes—first year, Applied Chemistry.
W. R. Hazell—third year, Civil Engineering.
G. D. Herman—fifth year, Chemical Engineering.
R. S. Herman—second year, Civil Engineering.
J. M. Higgins—fourth year, Civil Engineering.
K. R. Hillier—third year, Civil Engineering.
G. E. Holland—second year, Architecture.
W. H. G. Holmes—third year, Civil Engineering.
J. A. Hoore—second year, Electrical Engineering.
R. W. Hubery—first year, Chemical Engineering.
F. R. Hulscher—fourth year, Electrical Engineering.
Commonwealth Scholarships.

*Full-time Degree Students*—continued:

1. R. W. Humphreys—third year, Applied Chemistry.
2. J. S. Hyslop—first year, Civil Engineering.
3. A. Irving—fourth year, Mechanical Engineering.
4. I. H. Irwin—second year, Metallurgy.
6. A. M. James—second year, Civil Engineering.
7. R. C. Johnson—fourth year, Electrical Engineering.
8. R. J. Johnson—first year, Metallurgy.
10. J. R. Jones—third year, Civil Engineering.
15. J. K. Knight—third year, Civil Engineering.
17. V. Koskins—third year, Electrical Engineering.
21. A. M. Kuter—third year, Civil Engineering.
22. D. M. Kuter—fourth year, Civil Engineering.
23. D. T. Lacey—fourth year, Chemical Engineering.
24. H. Lamens—second year, Chemical Engineering.
27. A. G. Leask—fourth year, Mechanical Engineering.
29. T. B. Liggins—second year, Civil Engineering.
30. A. G. Light—first year, Mechanical Engineering.
32. T. N. Lockyer—fourth year, Applied Chemistry.
33. B. J. Lourey—second year, Applied Chemistry.
34. A. B. McDermott—third year, Electrical Engineering.
35. P. J. MacDessi—first year, Mechanical Engineering.
37. R. S. McKilligan—fourth year, Electrical Engineering.
40. A. S. Malin—third year, Metallurgy.
42. H. K. Marelli—first year, Architecture.
43. D. W. Marr—second year, Civil Engineering.
44. K. J. Mason—first year, Wool Technology.
Commonwealth Scholarships.

Full-time Degree Students—continued:

A. M. Mathew—third year, Mechanical Engineering.
R. B. Meulman—fourth year, Mechanical Engineering.
A. Mezdreis—fifth year, Architecture.
R. A. Mills—third year, Mechanical Engineering.
J. L. Moloney—fourth year, Electrical Engineering.
A. J. Morton—first year, Metallurgy.
A. F. Nagy—fifth year, Electrical Engineering.
K. H. Napier—fourth year, Applied Chemistry.
N. W. Neasbey—first year, Metallurgy.
A. C. Nichols—second year, Chemical Engineering.
H. Noordewier—second year, Applied Chemistry.
J. J. O'Brien—second year, Civil Engineering.
M. J. Olde—second year, Civil Engineering.
P. J. J. O'Neill—fourth year, Electrical Engineering.
J. Orlovich—fourth year, Mechanical Engineering.
M. K. Ormay—second year, Metallurgy.
D. J. Parrott—second year, Architecture.
J. L. Pascoe—first year, Electrical Engineering.
J. L. Pascoe—second year, Applied Chemistry.
W. Perm—fifth year, Architecture.
P. Piira—third year, Civil Engineering.
G. Popowski—second year, Mechanical Engineering.
J. Raffaele—second year, Civil Engineering.
D. W. Ray—fourth year, Architecture.
K. M. Ray—fourth year, Electrical Engineering.
M. R. Rayner—second year, Chemical Engineering.
J. W. Reimer—first year, Electrical Engineering.
P. S. Reimer—first year, Mechanical Engineering.
J. R. Rileigh—first year, Chemical Engineering.
P. J. Ring—first year, Mechanical Engineering.
J. Roseth—second year, Architecture.
J. W. Rudd—second year, Mechanical Engineering.
P. M. Ryan—fourth year, Civil Engineering.
H. Salamon—sixth year, Applied Chemistry.
L. J. Salkeld—third year, Mechanical Engineering.
J. E. Sanders—first year, Civil Engineering.
W. Savage—third year, Mechanical Engineering.
J. B. Skidmore—second year, Metallurgy.
J. N. Skinner—fourth year, Wool Technology.
R. J. Slater—third year, Civil Engineering.
R. L. Smythe—fourth year, Civil Engineering.
B. K. Snow—first year, Civil Engineering.
Commonwealth Scholarships.

Full-time Degree Students—continued:

I. K. Spence—third year, Mechanical Engineering.
R. M. Spencer—second year, Civil Engineering.
J. L. Stewart—third year, Electrical Engineering.
P. H. Stitt—second year, Civil Engineering.
A. R. Stuart—third year, Civil Engineering.
P. A. Sullivan—second year, Mechanical Engineering.
J. Szczucki—second year, Electrical Engineering.
P. J. Taylor—second year, Civil Engineering.
G. Thieben—fourth year, Civil Engineering.
B. J. Thompson—second year, Electrical Engineering.
F. C. Thorvaldson—third year, Architecture.
S. R. Tibbles—fourth year, Chemical Engineering.
B. J. Tosswill—second year, Electrical Engineering.
D. F. Trinder—first year, Architecture.
R. F. Tuddenham—second year, Applied Chemistry.
M. Veske—second year, Civil Engineering.
G. J. Vidler—first year, Civil Engineering.
D. L. Walker—first year, Applied Chemistry.
W. R. Watts—first year, Civil Engineering.
J. A. Weidemier—second year, Mechanical Engineering.
B. Wiggins—second year, Chemical Engineering.
F. L. P. Wilkinson—first year, Civil Engineering.
J. E. Winton—third year, Civil Engineering.
D. G. Wood—second year, Chemical Engineering.
D. R. Woodman—third year, Electrical Engineering.
G. K. Wyatt—second year, Chemical Engineering.
B. Young—first year, Civil Engineering.
R. F. Young—third year, Electrical Engineering.

Part-time Degree and Diploma Students:

E. F. Adcock—fifth year, Radio Engineering.
J. B. Anderson—third year, Mechanical Engineering.
B. W. Andrew—fifth year, Civil Engineering.
J. N. Arnold—second year, Architecture.
M. J. Atkins—first year, Chemical Engineering.
V. J. Audet—second year, Radio Engineering.
J. R. Bagshaw—second year, Applied Chemistry.
D. G. Barnsdall—second year, Accountancy.
Commonwealth Scholarships.

Part-time Degree and Diploma Students—continued:

J. F. Barton—third year, Civil Engineering.
R. A. Batchelor—second year, Radio Engineering.
L. E. Beard—fifth year, Electrical Engineering.
R. T. E. Bell—third year, Applied Chemistry.
P. J. Benbow—fourth year, Building.
P. J. Benjamin—second year, Accountancy.
J. A. Birch—fourth year, Physics.
B. G. Birtles—second year, Accountancy.
B. J. Blackmore—first year, Aeronautical Engineering.
L. J. Blakeman—fifth year, Mechanical Engineering.
D. N. Body—sixth year, Civil Engineering.
J. C. J. Booth—first year, Aeronautical Engineering.
W. B. Bowden—second year, Architecture.
P. H. Brady—third year, Applied Chemistry.
R. G. Brissett—third year, Civil Engineering.
J. W. Buchanan—second year, Architecture.
T. J. Campbell—second year, Civil Engineering.
G. J. Carr—first year, Applied Chemistry.
D. F. Cartwright—second year, Applied Chemistry.
H. H. S. Chaston—fifth year, Chemical Engineering.
F. P. Chesworth—third year, Architecture.
R. Chong—first year, Applied Chemistry.
W. Chuck—second year, Accountancy.
J. F. Clarke—fourth year, Civil Engineering.
I. Coggiola—third year, Applied Biology.
M. J. Comins—first year, Applied Chemistry.
J. J. Connolly—first year, Physics.
D. Cook—fifth year, Civil Engineering.
J. W. Coombes—third year, Civil Engineering.
R. F. Cornell—third year, Optometry.
A. J. Costoulas—fifth year, Applied Chemistry.
R. Cotham—fifth year, Chemical Engineering.
K. E. Cottier—second year, Architecture.
J. D. Court—first year, Metallurgy.
S. J. Cowper—fourth year, Applied Chemistry.
P. H. Cox—first year, General Science.
L. H. Cross—fourth year, Radio Engineering.
R. J. Cruikshank—first year, Applied Chemistry.
J. F. Cudmore—sixth year, Applied Chemistry.
W. Cumines—third year, Industrial Chemistry.
B. A. Cummings—first year, Civil Engineering.
D. Cunningham—second year, Architecture.
D. R. Davies—second year, Civil Engineering.
Commonwealth Scholarships.

Part-time Degree and Diploma Students—continued.

K. J. Davis—second year, Applied Chemistry.
P. J. Davis—third year, Metallurgy.
P. J. Dawson—second year, Accountancy.
M. A. Day—second year, Civil Engineering.
W. J. Dilley—third year, Electrical Engineering.
B. G. Doherty—first year, General Science.
W. W. Donald—fourth year, Electrical Engineering.
T. P. Doyle—second year, Applied Chemistry.
J. D. Dunk—third year, Mechanical Engineering.
C. W. Eldridge—third year, Production Engineering.
E. J. Elgood—fifth year, Applied Chemistry
R. J. Ellershaw—second year, Chemical Engineering.
J. R. Fenwick—third year, Civil Engineering.
B. T. Fitzgerald—third year, Metallurgy.
T. M. Florence—fifth year, Applied Chemistry.
M. E. Forster—first year, Applied Chemistry.
M. L. Fredericks—first year, General Science.
W. R. Gates—second year, Accountancy.
I. G. Galitsky—first year, Applied Chemistry.
P. R. Garrett—first year, Applied Chemistry.
R. W. Gilmour—third year, Metallurgy.
J. N. Gordon—fourth year, Architecture.
P. F. Goaling—second year, Accountancy.
J. A. Gould—first year, Civil Engineering.
D. C. Grace—first year, Accountancy.
A. H. Gray—fourth year, Chemical Engineering.
I. R. Gray—first year, Chemical Engineering.
K. H. Green—first year, Quantity Surveying.
G. E. C. Greenham—second year, Mechanical Engineering.
D. A. Grey—third year, Industrial Chemistry.
A. V. Griffiths—second year, Radio Engineering.
D. A. Groves—first year, Building.
R. F. Haile—second year, Applied Chemistry.
F. G. Hall—first year, Industrial Chemistry.
J. D. Halliday—first year, Accountancy.
J. Hanich—first year, Chemical Engineering.
D. S. Hanlon—fourth year, Radio Engineering.
R. A. Harris—first year, Industrial Chemistry.
D. A. E. Harrison—first year, Chemical Engineering.
K. A. Hassall—fourth year, Architecture.
G. J. Hay—third year, Quantity Surveying.
P. W. Headford—fifth year, Radio Engineering.
L. J. Henderson—second year, Applied Chemistry.
Commonwealth Scholarships.

Part-time Degree and Diploma Students—continued:

M. J. High—second year, Accountancy.
L. W. Hillen—first year, General Science.
H. J. Hodges—second year, Architecture.
D. J. Holm—second year, Accountancy.
R. J. Holt—fourth year, Electrical Engineering.
R. J. Hooper—first year, Architecture.
B. F. Hoskins—fourth year, Applied Chemistry.
R. M. Hoskinson—fifth year, General Science.
I. J. Howard—fourth year, Chemical Engineering.
P. R. Hunt—fifth year, Mechanical Engineering.
L. B. James—first year, Chemical Engineering.
G. J. Jameson—fourth year, Chemical Engineering.
H. W. Johnson—second year, Mechanical Engineering.
M. R. Jones—second year, Applied Chemistry.
A. Jostons—second year, Metallurgy.
M. J. Kabat—first year, Applied Chemistry.
D. R. Kennard—first year, Accountancy.
R. J. Kennard—first year, Accountancy.
R. H. Kennett—fifth year, Physics.
B. F. V. King—second year, Accountancy.
A. Kumnick—second year, Mechanical Engineering.
P. E. Lambert—first year, Industrial Chemistry.
J. A. Lane—first year, Radio Engineering.
F. L. Langshaw—third year, Mechanical Engineering.
A. D. Larking—first year, Chemical Engineering.
E. J. Lee—second year, Chemical Engineering.
R. A. Letts—fourth year, Optometry.
J. N. Levett—fourth year, Accountancy.
B. W. Little—first year, Architecture.
J. J. Lucas—third year, Applied Chemistry.
G. A. McCaughtrie—first year, Metallurgy.
W. C. McCredie—fourth year, Civil Engineering.
B. McDonald—second year, Building.
D. B. McDonald—second year, Accountancy.
J. M. McKay—first year, Chemical Engineering.
G. V. McLeod—third year, Electrical Engineering.
I. B. McMartin—first year, Optometry.
E. H. Maidment—fifth year, Chemical Engineering.
G. S. Mar—third year, Accountancy.
A. V. Milton—first year, Accountancy.
A. A. Morris—third year, Applied Chemistry.
K. R. Mottram—third year, Building.
Commonwealth Scholarships.

Part-time Degree and Diploma Students—continued:

R. J. Mouat—second year, Industrial Chemistry.
M. D. Moylan—third year, Civil Engineering.
R. Muhs—first year, Accountancy.
B. J. Mullen—second year, Industrial Chemistry.
P. Nash—third year, Applied Chemistry.
M. P. Nesbitt—first year, Applied Chemistry.
B. C. Newman—third year, Food Technology.
D. E. Noonan—fourth year, Applied Chemistry.
B. R. Norris—third year, Accountancy.
K. E. Odbert—third year, Aeronautical Engineering.
W. J. Oliver—third year, Civil Engineering.
B. P. O'Regan—first year, Chemical Engineering.
T. P. O'Rourke—second year, Applied Chemistry.
P. A. E. Pajor—second year, Industrial Chemistry.
M. Parkee—second year, Applied Chemistry.
B. J. Patterson—first year, Chemical Engineering.
J. B. Patterson—third year, Physics.
T. S. Pears—first year, Architecture.
D. L. Pearsall—second year, Accountancy.
P. M. Pearson—first year, Accountancy.
R. C. De Plater—third year, Metallurgy.
M. R. Powditch—second year, Accountancy.
J. D. Powell—first year, Production Engineering.
J. A. Pullin—second year, Industrial Chemistry.
T. C. Punnett—third year, Civil Engineering.
H. G. Quail—second year, Optometry.
J. M. Quinn—third year, Applied Chemistry.
R. M. Rabbidge—fifth year, Physics.
P. Raphael—first year, Industrial Chemistry.
A. A. Reitan—third year, Accountancy.
R. W. Richards—second year, Industrial Chemistry.
B. W. Roberts—fourth year, Mechanical Engineering.
R. J. Robinson—fourth year, Radio Engineering.
E. J. Rosen—first year, Architecture.
R. A. B. Rothery—second year, Accountancy.
M. L. Rothwell—seventh year, Chemical Engineering.
S. Rytmeister—second year, Mechanical Engineering.
I. Salasoo—sixth year, Applied Chemistry.
W. G. Schafer—third year, Applied Chemistry.
B. J. Shepherd—fifth year, Civil Engineering.
Commonwealth Scholarships.

Part-time Degree and Diploma Students—continued:

P. J. Shirley—fourth year, Architecture.
R. E. Sibthorpe—second year, Architecture.
A. W. Sietsema—second year, Accountancy.
M. E. Silva—second year, Civil Engineering.
C. M. Simpson—second year, Chemical Engineering.
G. J. Simpson—fifth year, Aeronautical Engineering.
L. Smit—first year, Chemical Engineering.
J. W. Smith—second year, Architecture.
N. G. Smith—second year, Accountancy.
S. A. Smith—second year, Accountancy.
R. R. Smithard—first year, Applied Chemistry.
W. A. Sollich—second year, Applied Chemistry.
J. Solowij—first year, Civil Engineering.
T. G. Souter—fourth year, Applied Chemistry.
G. S. Stacy—first year, Metallurgy.
J. J. Stacy—fifth year, Civil Engineering.
J. E. Stafford—third year, Accountancy.
B. R. Stanmore—third year, Chemical Engineering.
A. A. Stapleton—second year, General Science.
F. R. Stead—fourth year, Radio Engineering.
D. D. Stevenson—second year, Industrial Chemistry.
M. G. Stevenson—fourth year, Production Engineering.
M. J. Stewart—fifth year, Electrical Engineering.
P. S. B. Stewart—third year, Chemical Engineering.
J. A. Stinson—sixth year, Architecture.
P. R. Stinson—first year, Electrical Engineering.
J. P. Stone—first year, Civil Engineering.
S. Strasser—second year, Optometry.
V. J. Summersby—third year, Civil Engineering.
S. C. Symonds—sixth year, Architecture.
G. O. A. Tanner—sixth year, Architecture.
D. B. Targett—first year, Radio Engineering.
A. A. Thompson—first year, Radio Engineering.
B. E. Thompson—fifth year, Industrial Chemistry.
W. K. Thomson—second year, Chemical Engineering.
B. E. Tindale—seventh year, Chemical Engineering.
D. A. Towson—second year, Accountancy.
L. D. Vass—second year, Accountancy.
R. P. Vickery—second year, Architecture.
J. A. Waltho—third year, General Science.
R. E. Webster—fourth year, Optometry.
R. A. Wells—second year, Chemical Engineering.
K. L. White—third year, Civil Engineering.
Commonwealth Scholarships.

Part-time Degree and Diploma Students—continued:

W. H. Whittaker—fourth year, Civil Engineering.
B. F. Wild—first year, Electrical Engineering.
J. D. Wild—fourth year, Chemical Engineering.
C. M. Williams—first year, Accountancy.
C. G. Willis—first year, Industrial Chemistry.
C. J. Wilson—third year, Optometry.
R. E. Wilson—second year, Chemical Engineering.
A. Wolfe—second year, Applied Chemistry.
F. L. Wood—fifth year, Civil Engineering.
L. J. Woodley—first year, Industrial Chemistry.
E. P. Woolley—third year, Chemical Engineering.
J. L. Wright—fifth year, Radio Engineering.
R. B. Wright—first year, Accountancy.
B. P. Wynne—third year, Architecture.
B. A. Young—second year, Accountancy.

Newcastle University College.

Full-time Degree Students:

J. R. Anderson—first year, Arts.
H. R. Armstrong—first year, Arts.
R. B. Bunton—first year, Civil Engineering.
Rosemary S. Babbage—second year, Arts.
P. A. Bolte—third year, Arts.
K. H. Bell—first year, General Science.
F. T. Bagnall—first year, General Science.
B. W. Cooper—first year, Mechanical Engineering.
G. M. Cocking—first year, Civil Engineering.
R. A. Cunningham—fourth year, Mechanical Engineering.
J. L. Cook—third year, General Science.
J. P. Crabtree—first year, Mechanical Engineering.
D. A. Evans—third year, Civil Engineering.
F. C. Evans—second year, Civil Engineering.
Kathleen P. Farrell—first year, Arts.
Thea C. Frith—second year, Arts.
N. Gorbunow—third year, Civil Engineering.
Margaret P. Glock—first year, Arts.
L. A. Gledhill—second year, Arts.
Fay Griffiths—third year, Arts.
Robyn G. Garner—first year, Arts.
J. Goffet—second year, Arts.
Margaret H. Henri—third year, Arts.
J. W. Hemmings—third year, Arts.
Commonwealth Scholarships.

Full-time Degree Students—continued.

R. E. Hicks—third year, Arts.
A. J. Kennedy—first year, Civil Engineering.
D. C. Laycock—third year, Arts.
J. L. Mayo—first year, Arts.
E. McHugh—first year, Arts.
D. A. March—first year, Arts.
G. D. Nelson—fourth year, Civil Engineering.
A. G. Newman—third year, Civil Engineering.
Colette Ormonde—third year, Arts.
D. B. Proudfoot—first year, Mechanical Engineering.
T. L. Piggott—fourth year, Civil Engineering.
L. Pirona—first year, Arts.
Robyn L. Robertson—first year, Arts.
J. Roach—third year, Arts.
P. J. Schofield—first year, General Science.
J. R. Stephens—first year, Chemical Engineering.
J. L. Sawyers—second year, Arts.
Margaret E. Saddington—second year, Arts.
Gwendoline M. Tucker—third year, Arts.
Elaine M. Willets—third year, Arts.
Robyn J. Wood—third year, Arts.
J. S. Waddell—second year, Civil Engineering.
J. H. Watson—Fourth year, Mechanical Engineering.
G. K. Whalan—first year, Arts.
C. A. Whitehead—second year, Arts.
A. C. F. Wilson—third year, Arts.

Part-time Degree and Diploma Students:

P. H. P. Allen—third year, Chemical Engineering.
A. S. Atkins—third year, Arts.
A. R. Ambler—second year, Mechanical Engineering.
B. L. Adcock—second year, Architecture.
M. J. Burns—second year, Chemical Engineering.
D. R. Carr—second year, Applied Chemistry.
D. B. Cross—third year, Civil Engineering.
J. M. Delbridge—second year, Chemical Engineering.
R. L. Griffin—second year, Electrical Engineering.
J. R. Hammond—second year, Metallurgy.
R. E. Hodge—third year, Arts.
J. M. Kelly—second year, Electrical Engineering.
J. A. Lewis—fifth year, Metallurgy.
Commonwealth Scholarships.

**Part-time Degree and Diploma Students—continued:**

- W. A. Matthews—fourth year, Mechanical Engineering.
- B. E. Miller—second year, Mechanical Engineering.
- H. G. Moore—fourth year, Mechanical Engineering.
- W. V. Moloney—first year, Chemical Engineering.
- P. J. Michael—third year, Civil Engineering.
- J. J. O’Shea—second year, Mechanical Engineering.
- E. V. Payne—first year, Civil Engineering.
- B. W. J. Proudfoot—second year, Industrial Chemistry.
- H. W. Read—first year, Applied Geology.
- S. A. Rose—first year, Metallurgy.
- T. W. Riley—first year, Mechanical Engineering.
- L. B. Sharp—first year, Industrial Chemistry.
- B. J. Suters—second year, Architecture.
- J. W. Wamsley—second year, Metallurgy.

**APPENDIX IV.**

**Degree Conferred at Kensington on 19th June, 1956.**

**FACULTY OF SCIENCE.**

**Doctor of Science Honoris Causa (D.Sc.)**

His Excellency, Sir John Northcott, K.C.M.G., K.C.V.O., C.B.,
Hon.D. Litt. Syd., Governor of New South Wales.

**Degrees Conferred at Kensington on 14th April, 1956.**

**FACULTY OF SCIENCE.**

**Doctor of Philosophy (Ph.D.).**

**School of Applied Chemistry.**

- Mary Helen Maguire, B.Sc. Syd.
- Gervaise John Sutton, M.Sc. A.S.T.C.

**School of Chemical Engineering.**

- Geoffrey Harold Roper, M.Sc., A.S.T.C.
School of Mathematics.
Austin Keane, M.Sc.Syd.

Master of Science (M.Sc.)

School of Applied Chemistry.
Bryan Michael Gatehouse, B.Sc.Tas.
June Clare Griffith, B.Sc., A.S.T.C.
Robertson Wentworth de Miklouho-Maclay, B.Sc.Lond., A.S.T.C.
Abdur Rauf, M.Sc. (Tech.) Punjab.
Maxwell Campbell Steele, A.S.T.C.

School of Applied Physics.
Josef Lederer, B.Sc.Syd., A.S.T.C.

School of Chemical Engineering.
Herbert Fowler, A.S.T.C.
John Leslie Sullivan, F.S.T.C.

School of Metallurgy.
Max Hatherly, A.S.T.C.

School of Wool Technology.

Bachelor of Science (B.Sc.)

School of Applied Chemistry.

Honours.
John Peter Boyer (Class I).
Graham Richard Draper (Class II).
Maxwell James Lamond, A.S.T.C. (Class II).
Barry Lathlean, A.S.T.C. (Class II).
George Neu (Class II).

Pass.
Norman Thomas Barker, Dipl.Sc.Liverpool.
Walter James Barry, A.S.T.C
Robert John Bolton.
Nevell John Cameron, A.S.T.C.
Aristotle John Costoulaς.
Kerry Harold Crowe-Mai, A.S.T.C.
Ian Stanley Dewhurst, A.S.T.C.
Keith John Farrington, A.S.T.C.
Pass—continued.
Shirley Gladys Garvin-Smith, A.S.T.C.
Roy Thomas Gregory, A.S.T.C.
Thomas Alwyn Jones, A.S.T.C.
Colin Harold Leslie Kennard.
Michael John Miceli.
John Warren Milne.
Barry Leonard Morrison.
Barry Vincent Neill, A.S.T.C.
Reginald William O’Brien, A.S.T.C.
Gunars Ozols, A.S.T.C.
Ian Harold Reece.
Gerald Frederick Rhoades, A.S.T.C.
William Robert Rogers, A.S.T.C.
Noel Edward Roscoe, A.S.T.C.
Malcolm Bruce Smith, A.S.T.C.
Ronald David Clark Smith, A.S.T.C.
Raymond George Thompson, A.S.T.C.
Alexander MacDonald Webster.
Fredrick Ross Whiddon, A.S.T.C.

School of Chemical Engineering.
Honours.
Alban Jude Lynch, A.S.T.C. (Class II).
Barry George Madden, A.S.T.C. (Class II).
Douglas Harold Wilson, A.S.T.C. (Class II).

Pass.
Bambang Abimanju.
Don Milton Ernest Stanly Bulathsinghala.
Francis Leon Dogan, A.S.T.C.
Ross Malcolm Duesbury.
David Rankin Golightly.
George Lang Herwig, A.S.T.C.
Rex Louis Torzillo, A.S.T.C.
David Whitfeld.

School of Metallurgy.
Pass.
Colin Douglas Campbell, A.S.T.C.
Peter George McDougall, A.S.T.C.
Greig Richard Wallwork, A.S.T.C.

School of Wool Technology.
Honours.
Stanley Harold Chorlton (Class II).
PASS.
Erhard Paul Göhl.
Christopher Hugh Pratten.

Bachelor of Science (Optometrical Science) B.Sc. (Opt.Sc.)

School of Applied Physics.
Honours.
George Amigo, A.S.T.C. (Class I and University Medal). (aeq.)
Colin Robert Brown, A.S.T.C. (Class I and University Medal).
(aeq.)
John Thomas Bromley, A.S.T.C. (Class II).

PASS.
Owen Ashley Williams, A.S.T.C.

Faculty of Engineering.

Doctor of Philosophy (Ph.D.)

School of Mining Engineering and Applied Geology.

Bachelor of Engineering (B.E.)

School of Civil Engineering.
Honours.
Trevor Regis Fietz (Class I)
Raymond John Frost (Class II).
Ago Kuru (Class II).
William Nelson Leng (Class II).
Malcolm Lyle Pittaway (Class II).
Eric James Silva, A.S.T.C. (Class II).

PASS.
Michael Newman Clarke.
Alan William Henry.
Thomas Woon Chin Lee.
John Preston Moreton.
Donald Thomas Newton.
Rein Nittim.
Noel Pearce.
Frederick Adrian John Stein.
Robert Parry Whatham.
Geoffrey Walter Wheeler.
SCHOOL OF ELECTRICAL ENGINEERING.

HONOURS.

Cedric St. John Lamb, A.S.T.C. (Class I).
Ross Mathew Lennon (Class I).
Ronald George McCarthy (Class I).
Kevin Patrick Cleary (Class II).

PASS.

Paul William Butler, A.S.T.C.
Richard Arthur Corin.
John Coyle.
John Phelps Crowe.
Neville James Ellem.
Arthur Brian Goldhammer.
Stanley Noel Graves, A.S.T.C.
Bruce Leslie Grieve.
Hubert Edward Hamilton.
John Douglas Hampton.
Igor Boris Ivashkoff.
Clifford Owen Johnstone.
Siaw Phin Lee.

SCHOOL OF MECHANICAL ENGINEERING.

HONOURS.

Simon Cornelis van der Kolff, A.S.T.C. (Class I and University Medal).
Leslie Cridland, A.S.T.C. (Class II).
Walter Harold Magnussen, A.S.T.C. (Class II).
Ratnam Kandaswamy Pillay (Class II).
Dudley Lawson Roth (Class II).
John Milton Savage (Class II).
Roy Arnold Williams, A.S.T.C. (Class II).

PASS.

Charles Bennett.
Mervyn Royce Eagles.
Kevin Jan.
Rodney Donald Lamb.
Robert Claus Leeser.
Edward Alan Mann.
Pass—continued.

James Bryan Murch.
Livio Panozzo.
Michael Thomas Frederick Pines.
John Mead Waring.

School of Mining Engineering and Applied Geology.
Honours.
Chiao Shen Fu (Class II).
Pass.

Richard Charles Nolan.

Faculty of Architecture.

Master of Architecture (M.Arch).
School of Architecture and Building.
Ralph Oswald Phillips, B.Arch.Syd.
Bachelor of Architecture (B.Arch).
Honours.
Ilmars Karlis Lodens (Class I).
Pass.

John Dudley Moore.

Degrees Conferred at Newcastle University College on 23rd March, 1956.

Faculty of Science.

Master of Science (M.Sc.).
School of Applied Chemistry.
William Frederick Joseph Pickering, B.Sc., A.S.T.O.

Bachelor of Science (B.Sc.).
School of Applied Chemistry.
Pass.
Alexander Newton, A.S.T.C.
APPENDIX V.

Research Activities.

The following research projects were conducted in the various Schools of the University in 1955-56:

School of Applied Physics.

(a) As a requirement for the degree of Doctor of Philosophy:

(i) Metal spectroscopy—S. C. Baker.
(ii) Nuclear magnetic resonance—L. O. Bowen.
(iii) Mass spectrometers of high sensitivity for the intermediate mass range—L. A. Cambey.
(iv) Optical diffraction applied to crystal structure determination—J. F. McConnell.
(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) Some visco-elastic properties for the wool fibre—B. J. Rigby.
(iii) Computational aids for X-ray structure determination—A. Schwartz.
(iv) Electronic techniques applied to spectroscopy—W. G. Walker.
(v) X-ray diffraction application of scintillation counters—J. B. S. Waugh.
(vi) The stabilisation and scanning of magnetic fields by nuclear resonance—K. H. Marsden.
(vii) Physiological and clinical aspects of flicker fusion—C. R. Brown.
(viii) Certain aspects of visual space perception—G. Amigo.
(ix) Solar furnace studies—J. B. Webster.
(x) Some aspects of the process of fracture in glass—J. W. Ziegler.

(c) Other projects:—

(i) Design studies on optical instruments.
(ii) Optical systems for solar furnaces.
(iii) Design studies on high vacuum pumps.
(iv) A bidirectional electronic counter.
(v) Spectrographic and X-ray diffraction analysis of materials.
(vi) X-ray diffraction in physical metallurgy.
(vii) Transient sounds in organ pipes.
(viii) Study of wool fibres by X-ray diffraction.
(ix) Methods for assessment of corrosion in gasholders.

(d) Publications:—

SCHOOL OF APPLIED CHEMISTRY.

Department of Physical Chemistry.

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) Spectroscopic studies of molecular structure—R. L. Werner.
(ii) Studies in chemical kinetics of gaseous reactions—E. S. Swinbourne.
(iii) Studies in the colloidal and biological properties of organic insecticides—G. T. Barnes.
(v) Physico-chemical studies of dough—N. W. Tschoegl.

(b) As a requirement for the degree of Master of Science:—

(i) Fundamental studies of emulsions and suspensions of biologically active compounds with special reference to D.D.T., benzene hexachloride and similar compounds—D. K. O’Neill.
(iii) Formation and properties of monodispersed sulphur sols—P. D. Lark.
(iv) The penetration of D.D.T. through the cuticle of the cattle tick—W. J. Roulston.
(v) The intensity of the hydroxyl band in infra-red spectra—T. D. Flynn.
(vi) Diffusion of gases through monolayers and other films—J. G. Hawke.
(vii) The absorption of polar organic compounds on titania and other solids—L. Dintenfass.
(viii) Substitution of square planar complexes—G. Curthoys.

(c) Other projects:

(i) The intensity of hydroxyl band in the infra-red region near 3 microns.
(ii) Spectroscopic studies of boroxols and borates.
(iii) The infra-red spectra of organo-titanium compounds.
(iv) The equilibrium between diazotates and diazorium salts by means of their ultra-violet absorption spectra.
(v) The infra-red spectra of inorganic nitrosyl compounds.
(vi) The infra-red and Raman spectra of some alkyl isothiouronium salts.
(vii) Hydrogen bonding in some solid alcohols.
(viii) The characterisation of the polymer latex in plastic paint technology.
(ix) The infra-red spectrum of o-methyl isourea.
(x) A.C. polarography.
(xi) Electron microscopy.
(xii) The dielectric properties of complex salts.
(xiii) Study of the electrical resistance of pure metals as a function of temperature.
(xiv) Application of distribution function to various physical properties.
(xv) Investigation of crystal growth with special consideration of screw dislocations.
(xvi) Surface active agents.
(xvii) Vitamin A analysis.
(xviii) Infra-red and Raman spectra of methyl arsines.
(xix) Effects of β —radiation in electrode processes.
(xx) Tracer studies in plants and soils.

d) Publications:


Department of Analytical Chemistry.

(a) As a requirement for the degree of Doctor of Philosophy:
   (i) Paper partition chromatography—E. C. Martin.

(b) Other projects:
   (i) Studies in chromatography.
   (ii) Studies on anti-fouling paints.
   (iii) Chromatographic examination of permissible food dyes.
   (iv) The application of ion exchange columns to the separation of calcium, strontium and barium.
   (v) Studies of the amperometric methods of determining traces of elements.
   (vi) Studies on the polarography of palladium complexes.
   (vii) Stability constants of inorganic complexes.

(e) Publications:

Department of Inorganic Chemistry.

(a) As a requirement for the Degree of Doctor of Philosophy:
   (i) Co-ordination compounds of groups IB and VIII with chelate compounds of sulphur—J. R. Backhouse.
   (ii) Complex carbonyls of platinum—E. A. Magnusson.

(b) As a requirement for the degree of Master of Science:
   (i) Stereochemistry of complexes of nickel—Miss T. Christie.
   (ii) Infra-red spectra of inorganic complexes—V. Cranmer.
   (iii) Stereochemistry of complex compounds—L. C. Lock.
   (v) Magnetic studies of metal-metal interactions on co-ordination compounds—Miss H. Waterman.
(c) Other projects:—

(i) Complexes of vanadium.

(ii) Use of radio-isotopes in the study of metallic complexes.

(iii) Studies in the chemistry of metal carbonyl and nitrosyl compounds.

(iv) Investigations into polynuclear complexes.

(v) Crystal structures of compounds of orthophenylenebis(dimethyl arsine co-ordinated with metal halides.

(vi) Orbital contribution in magnetic moments of tetrahedral and octahedral cobalt II complexes.

(vii) Conductivities of co-ordination compounds in organic solvents.

(viii) Five and six-covalency in diarsine complexes of PdII, PtII, NiIII, FeII, and CoII.

(ix) 1, 10-phenanthroline complexes of CuII.

(x) Reaction of halide ions with bis (1, 10-phenanthroline) nickel II and cobalt II in non-aqueous solutions.

(xi) Application of infra-red spectroscopy to the study of the nature of bonds in co-ordination complexes.

(xii) Magnetoochemistry of complex fluorides.

(xiii) Magnetic studies with the copper salts of organic acids.

(d) Publications:—


*Department of Organic Chemistry.*

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) Oxidation processes in organic chemistry—E. R. Cole.

(ii) Triterpenes of the friedelane series—J. L. Courtney.

(iii) The chemistry of ants—D. L. Ford.

(iv) Some studies in the chemistry of cyclitols—P. T. Gilham.

(v) Synthesis and comparative studies of cyclitols—D. J. McHugh.

(vi) The synthesis of purines and pyrimidines—R. K. Ralph.


(viii) Studies on the configuration and reactions of glycols—R. J. Young.

(b) As a requirement for the degree of Master of Science:—

(i) Some oxidations with lead tetra-acetate—H. E. Barron.

(ii) Chemical studies on “Stick” ants and related species—H. D. Locksley.
(iii) Studies in the essential oil flora of Australia, with particular reference to physiological forms—H. C. McKern.

(iv) Triterpenes from the latex of *Ficus* Spp.—C. J. Miller.

(v) The sapogenins of *Emmenospermum alphitonioides*—H. V. Simes.

(c) Other projects:—

(i) The synthesis of organo-phosphorus compounds.

(ii) Studies on purines, pyrimidines, glyoxalines and related compounds.

(iii) The chemistry of *Castanospermum australe* (“Black Bean”).

(iv) The chemistry of *Emmenospermum alphitonioides* (“Bone Wood”).

(v) The chemistry of *Sideroxylon pohlmanianum*.

(vi) Investigations on plants poisonous to stock.

(vii) Catalysed aerial oxidation of cyclitols.

(viii) The odorous constituents of sewer gases.

(ix) The chemistry of phenoxazine.

(x) Mechanism of the Dakin reaction.

(xi) Investigation of the natural pest resistance of Australian timbers.

(xii) The friedelene-oleanene rearrangement.

(d) Publications:—


*Department 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. Wood.

(b) As a requirement for the degree of Master of Science:—

(i) Submerged culture techniques and the metabolism of fungi—J. Armstrong.


(iii) Terminal oxidase systems in fungi—L. Faulkner.

(iv) The "greening" bacteria of processed meat—Miss S. Armstrong.

(v) The cytology of the higher fungi—J. Sutton.

(c) Other Projects:—

(i) The degradation by micro-organisms of aromatic compounds related to lignin.
(ii) Studies on anti-metabolites of nucleic acid derivatives.
(iii) Studies on precursors of azoles and purines.
(iv) Field observations on *Leiopelma hochstetteri* Fitzinger and *L. archeyi* Turbott in the Coromandel Peninsula, New Zealand.
(v) The post-cranial skeleton of *Leiopelma hamiltoni* McCulloch.
(vi) Studies on the *Drosophilidae* of New South Wales.
(vii) Ecological studies of the bean aphid.

(d) Publications:—


SCHOOL OF CHEMICAL ENGINEERING.

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) Purification of uranium compounds from ores—R. E. C. Beattie.

(ii) Some studies related to laminated phenolic plastics—F. O. Howard.

(iii) Research into the mechanism of the boiling of sodium metal—T. L. Judell.


(v) The use of ion exchange membranes for concentration of electrolytes—G. G. Madgwick.

(vi) Studies in heat transfer and sublimation at low pressure—J. Norman.

(vii) The development of fluorination processes—J. D. Smith.

(viii) Studies in ion exchange and adsorption—P. Souter.

(ix) Kinetic studies relating to the complete gasification of coal—N. T. Stoddart.

(x) Absorption of zinc vapour in molten lead—N. A. Warner.

(xi) Studies in the utilisation of gypsum for the production of heavy chemicals—S. M. Zahid.
(b) As a requirement for the degree of Master of Science:—

(i) The fluidised roasting of pyritic ores—F. W. Ayscough.

(ii) Phase equilibrium and solid-state reaction in the system $\text{ZrO}_2-(\text{Al}_2\text{O}_3)$—H. Fowler.

(iii) A study of scale growth in processing equipment in the sugar industry—D. R. Golightly.

(iv) An investigation of the performance and design of petroleum tube-still furnaces—P. Huggins.

(v) The causes and mitigation of the corrosion of a town's gas distribution systems—T. W. Hughes.

(vi) Studies in the fluosolid conversion of gypsum to its dehydration product—C. H. Hunt.

(vii) Electrochemical fluorination of heterocyclic compounds—B. G. Madden.

(viii) Side chain chlorination of toluene—J. S. Ratcliffe.

(ix) The study of crystal growth using optical methods—C. L. Samways.

(x) The formation of resin-alum siez on paper—N. A. Whiffen.

(c) Other projects:—

(i) Investigation of scale formation in alcohol distilleries.

(ii) Studies in the electrofluorination of pyridine and its homologues.

(iii) The motion of single bubbles rising in liquid.

(iv) Survey of the clays of New South Wales in conjunction with School of Mining Engineering and the Mines Department of New South Wales.

(v) Studies of refractory materials containing uranium and thorium.

(vi) Mathematical methods in chemical engineering with special reference to high speed computers.

(vii) Effect of low frequency vibration on liquid systems.

(viii) Gas phase resistance to mass transfer.

(ix) Removal of organic sulphur from coal gas.

(x) Fluidised chlorination of $\text{TiO}_2$, $(\text{Al}_2\text{O}_3)$ and $\text{ZrO}_2$.

(xi) Atmospheric pollution in New South Wales industrial areas.

Department of Food Technology.

As a requirement for the degree of Master of Science:—

(i) Bleaching of tallows—M. S. Choudhry.

(ii) The retention of colour in tomato concentrates—R. A. Edwards.

(iii) A study in dehydration—V. G. Hatwalne.
SCHOOL OF METALLURGY.

(a) As a requirement for the degree of Doctor of Philosophy:
   (i) A study of problems relating to the production of reactive metal alloy powders—R. G. Robins.
   (ii) The effect of deformation inhomogeneities on preferred orientations—M. Hatherly.
   (iii) Mass transfer between molten metals and fused salts—F. Lawson.

(b) As a requirement for the degree of Master of Science:
   (i) The effect of hydrogen ion concentration on the viscosity of clays and on the properties of moulding sands—A. J. Anderson.
   (ii) The effect of "barriers" such as slip lines, deformation bands and low angle boundaries on the propagation of martensite plates—T. W. Barnes.
   (iii) A study of gas-metal reaction kinetics—S. E. Coalstad.
   (iv) The use of copper as an additive to, and as a substitute for, nickel in some stainless steels—C. H. Cooke.
   (v) The reduction of oxides and other compounds to metals, with special reference to the selective reduction of iron and phosphorus from slags of appreciable iron and manganese content—J. A. Gregory.
   (vi) Study of metal-mould reactions with particular reference to the casting of titanium—J. W. F. Hitchon.
   (vii) The technical development and prospects of the Australian copper industry—L. A. Lyons.
   (viii) Deformation of body centred cubic metals—J. E. McLennan.
   (ix) The determination of the homogeneous and inhomogeneous strains accompanying the martensitic transformation in medium carbon steels—P. G. McDougall.
   (x) The reduction of iron oxides with particular reference to iron ores—V. J. Moran.
   (xi) Some factors affecting the weldability of titanium with special reference to the effects of oxygen, nitrogen and hydrogen—J. M. Newburn
   (xii) Gas-metal surface reactions at high temperatures—G. Wallwork.

(c) Other projects:
   (i) Gas-solid reaction kinetics.
   (ii) Investigation and refining of lead bullion by chlorination.
   (iii) Dressing rate of high purity lead—influence on the dressing rate by impurities.
(d) Publications:


SCHOOL OF MECHANICAL ENGINEERING.

(a) As a requirement for the degree of Doctor of Philosophy:

(i) An investigation of pressure-wave phenomena in exhaust pipes of an internal combustion engine—S. E. Bonamy.

(ii) The determination and evaluation of design data for rubber components under shear, compressive and complex loading systems—A. J. Carmichael.

(iii) Dispersal of dust particles from industrial stacks—G. T. Csanady.

(iv) The design, construction and testing of a mechanical pumping plant for handling liquid sodium—J. Hirschhorn.

(v) An investigation of the effect of floating bodies on water wave action, with particular reference to the development of floating breakwaters for reflection of shallow water waves—A. K. Johnston.

(b) As a requirement for the degree of Master of Engineering:

(i) The mechanical properties of rubber under slow cyclic loading conditions—E. Betz.

(ii) Practical problems associated with printing block surfaces—H. A. Borchardt.

(iii) The design, construction and experimental testing of a high pressure quick steaming boiler—K. R. Bridger.

(iv) Improvement and application of the gas dynamics analogy—R. A. A. Bryant.


(vi) An investigation of the performance of high-powered aero-plane engines, with notes on Australian operating conditions—K. R. A. O'Brien.

(vii) An investigation of the performance of grain augers—A. W. Roberts.

(viii) The application of advanced photographic techniques to engineering research—R. G. Robertson.
(ix) Small scale utilisation of solar energy—C. M. Sapsford.

(x) An analysis of standard practice of surface finish measurement and the development of an improved system of specifying surface finish—H. Selinger

(xi) An analysis of motor vehicle exhaust systems—R. W. Upfold.


(c) Other projects:

(i) Philosophical studies in kinematics of mechanisms.

(ii) Field experiments in tillage practice.

(iii) Development of cast scarifier point.

(iv) Efficiency of absorption refrigerator.

(v) An analytical approach to the design of aerofoil bladed centrifugal fans.

(vi) Research on aerofoil and wind tunnel theory, particularly problems involving flow past porous surfaces.

(vii) The study of the geometry of threading tools and its effect on the form of the thread.

(viii) Design and performance of fluid couplings.

(d) Publications:


SCHOOL OF ELECTRICAL ENGINEERING.

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) A study of non-linear control systems—R. M. Huey.

(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) Some effects of control grid current in radio receiving valves on associated circuits—E. Watkinson.

(iv) Applications of magnetic modulation—R. G. Smart.

(v) A study of metadynes—W. H. Arnold.

(vi) Some aspects of magnetic amplifiers—B. S. Omelchuk.
(vii) A transistor-operated frequency standard—G. J. Parker.
(viii) Design of protective fittings for string insulators—E. Buckler.
(ix) Theory and design of impulse generators—R. H. J. Clarke.
(x) Application of the digital computer to the study of certain problems in electrical engineering—G. Karoly.

(c) Other projects:
(i) The construction of an electronic analogue computer for the solution of linear and non-linear differential equations.
(ii) The construction of a simulator to facilitate the design of nuclear reactors.
(iii) Development of an electrical analogue for a synchronous machine under grant from the Electrical Research Board.
(iv) Development of a recurrent surge generator.

(d) 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 and dust suppression in coal mines—R. G. Burdon.
(ii) An investigation into the causes of landslides and their relationship to geological formations and structures, with special reference to conditions in the Illawarra district—F. N. Hanlon.
(iii) The origin and physical and chemical properties of New South Wales commercial clays—F. C. Loughnan.

(b) As a requirement for the degree of Master of Science:
(i) Geology of radioactive deposits with special reference to New South Wales—E. O. Rayner.
(ii) The physical properties of New South Wales sandstones used in the building trade—H. G. Golding.
(iii) Correlation of the Permian Horizons of New South Wales—H. O. Fletcher.
(iv) Deuteric mineralisation of the Prospect Intrusion—R. O. Chalmers.


(vi) Contact metamorphic and pyrometasomatic mineralisation at Mt. Tennyson, Yethome, New South Wales—D. Pinkstone.

(vii) Stratigraphic use of the Permian foraminifera—T. Rose.

(viii) The structure and stratigraphy of the coal measures south of Newcastle—D. J. McGarry.

(ix) Trace elements and accessory minerals of the Borehole seam—A. S. Ritchie.

(x) Stratigraphy, structure and mining geology of the Upper Devonian Series near Eden—L. R. Hall.

(c) Other projects:—

(i) The pre-treatment of coated heavy minerals from beach sands.

(ii) Recovery of cassiterite from composite mineral particles of cassiterite-magnetite.

(iii) Beneficiation of gypsum.

(iv) Investigation of the physical properties of magnetite for use in heavy media separators.

(v) Ventilation survey of Coal Cliff Colliery.

(vi) Study of the mineralogy of New South Wales beach sands.

(vii) Chemical and mineragraphic investigations of the uranium minerals from the Mt. Isa-Cloncurry district.

(viii) Study of the clay deposits and resources of New South Wales—(in conjunction with the School of Chemical Engineering and the New South Wales Department of Mines).

(ix) Mineralogical study of the manganese ores of New South Wales.

(x) Study of the phosphate mineralisation of certain alluvials in the Cobargo district.

School of Civil Engineering.

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) The interaction of superstructure and its foundation—G. J. Haggarty.

(ii) Shear strength of concrete beams—A. S. Hall.


(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 with special reference to desk systems and roof shells—P. S. Balint.

(iii) Photo-elastic methods for the investigations of stresses in soils—A. G. Douglas.

(iv) The investigation of laminated timber structural members—J. L. Jenkins.

(v) Stress analysis by experimental methods—D. Axelrad.

(vi) Behaviour of slabs—R. Woodhead.

(vii) Investigations into electro-chemical hardening of soils, and its effect upon shear characteristics—A. F. S. Nettleton.


(ix) Screening of aggregates—B. W. Gould.


(xi) Improved methods of urban drainage design—I. R. Wood.

(xii) Aerodrome drainage design—J. R. Burton.


(xiv) Short range flood forecasting—P. Armstrong.

(xv) Adequacy of hydrologic data in New South Wales—J. R. Learmonth.

(xvi) Relation of long-term yield to climatic characteristics of catchments—E. Laurenson.

(xvii) Bore pressures in earth structures—B. Slavin.


(xx) Bond in prestressing wires—K. A. Faulkes.


(xxii) Creep in continuous prestressed beams—K. Saeed-Ud-Din.

(xxiii) Effect of prestress on the modulus of elasticity of concrete—M. Haq.

(xxiv) Shear strength of continuous prestressed concrete beams—A. Crimp.
(c) Other projects:

**Hydrology.**

(i) Methods of flood estimation.

(ii) Relationship between rainfall and run-off on small experimental catchments.

(iii) Measurements of gutter flow.

**Materials.**

(i) Physical and chemical properties of soils.

(ii) Use of fly-ash as a pozzolan for concrete.

(iii) Electro-chemical hardening in soil stabilization.

(iv) Methods of testing for concrete durability.

(v) Mechanical and petrological properties of Australian rocks—(in conjunction with School of Mining Engineering and Applied Geology).

(vi) Analysis of curved rib and roof design for underground power station structures by means of analytical and mathematical methods—(in conjunction with Snowy Mountains Hydro-Electric Authority).

(vii) Critical forces for anisotropic plates and plates beyond the elastic range.

(viii) Design of concrete mixes.

(ix) Determination of stresses in deep beams by photo-elastic methods.

(x) Torsional properties of polygonal shafting and corresponding hub connections.

(xi) The electrical analogy for the determination of seepage flow.

**Structures.**

(i) Flexural properties of prestressed concrete beams.

(ii) Load testing of prestressed concrete structures.

(iii) Buckling of rectangular plates uniformly compressed in two perpendicular directions with one free edge and elastically restrained against rotation along opposite edge.

(iv) Buckling of rectangular plates with two free edges.

(v) General method of obtaining deflection curves of beams.

**Surveying.**

(i) Elastic properties of steel measuring bands.

(ii) Barometric levelling.
Hydraulics.

(i) Sediment entrainment in closed conduits.

(ii) Air-water mixture.

(iii) Characteristics and design of irregular spray nozzles.

(d) Publications:


SCHOOL OF WOOL TECHNOLOGY.

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) Practical application of methods of selection promising to yield the greatest improvement in wool production—E. M. Roberts.


(b) As a requirement for the degree of Master of Science:—

(i) A chemical and histological study of fellmongering—K. J. Whiteley.

(ii) Investigations of the relationship between fibre length and fibre diameter amongst several breeds of sheep, and at high and low levels of nutrition—K. Ozcan.

(iii) Attempts to evolve an esophageal fistula for studies of forage intake of naturally grazing sheep in varying environments—W. R. McManus.

(iv) Formulation of efficient breeding plans for Australian Corri- dale sheep by estimation of genetic and environmental parameters—D. B. Hughes.

(c) Other projects:—

(i) Wool survey analysis.

(ii) Flock testing.

(iii) An investigation of the relationship between fertility and production in a number of strains of Merino sheep.

(iv) An investigation of the effect of seasonal variations in growth of improved and unimproved pasture on the wool production of a number of Merino wethers.

(v) An investigation of the use of finer fleece measurements as an improved estimate of the genetic value of a ram.

(d) Publications:


**Press Publications:**—


**SCHOOL OF MATHEMATICS.**

(a) As a requirement for the degree of Doctor of Philosophy:—


(b) As a requirement for the degree of Master of Science:—

(i) Some new types of quality control charts designed to reduce the amount of inspection and the sensitivity to non-normality of the parent distribution—H. Weiler.


(iii) Wave propagation in a stratified medium—B. E. Clancy.

(iv) Further work on the behaviour of fluids with quasi-spherical molecules—J. A. Lambert.

(c) Other projects:—

(i) Development of an analogue differential analyser.

(ii) Studies on the freezing point of milk—(in collaboration with the School of Applied Chemistry).
(iii) The prediction of student performance from examination results.

(iv) Pattern variants on a square field.

(v) The slow flow of fluids through porous materials with application to problems connected with mine ventilation.

(vi) In connexion with the research work of this and other Schools, the following topics have been the subject of work by the Computation Laboratory:

- Elasticity calculations;
- Australian banking statistics;
- Examinations results throughout the University;
- Analyses of data relating to *Leiopelma archeyi*;
- Fourier analyses relating to crystal structure;
- Freezing point of milk;
- Solids-not-fat content of milk;
- Calculations on isotopic hydrocarbons;
- Hardness indentations in annealed brass.

(d) Publications:


School of Architecture and Building.

(a) As a requirement for the degree of Master of Architecture:—

(i) The influence of sunlight and daylight on the design of buildings—R. O. Phillips.

(ii) A critical analysis of aesthetic principles underlying contemporary architectural design—P. Spooner.

(iii) Economy of materials in multi-storey structures—F. Woolard.

(iv) Design of auditoria with particular reference to acoustics—Miss A. Greenslade.


(b) Publications:—

(i) Technological Education in Architecture, Building, and Quantity Surveying, etc. F. E. A. Towndrow, Study Leave Report to Council.


School of Applied Psychology.

(a) As a requirement for the degree of Doctor of Philosophy:—

(i) Psychological study of executives in Australian industry—E. E. Davies.

(b) Other projects:—

(i) Investigation of the effects of television on the habits and attitudes of families in the Sydney metropolitan area. A random sample of Sydney families will be studied before and after the introduction of television in Australia.

(ii) Survey of selection and training needs of the advertising industry.
SCHOOL OF TEXTILE TECHNOLOGY.
(a) As a requirement for the degree of Master of Science:
(i) The visco-elastic behaviour of fibre assemblies—A. G. Stutter.
(ii) Diffusion in Keratin fibres—A. R. Haly.
(iii) The ageing of fibre assemblies—A. D. Dircks.
(b) Publications:

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES.
Economics.
(iii) Special accounts as a means of central bank control, 1941-1955—N. Runcie.
Publications:

English.
(i) Satire—English and French critical theory of poetry in the late 17th and early 18th centuries—P. K. Elkin.
(ii) The history of English criticism in the 19th and 20th centuries—O. N. Burgess.
(iii) Work begun on an anthology of modern Australian poetry for Heinemanns Ltd.—O. N. Burgess.
(iv) Syntactic and semantic aspects of intonation—A. Delbridge.
Publications:


History and Government.

(i) Political, social and economic developments in New South Wales, 1860-1880—S. M. Ingham.


(iii) The History of the White Australia Policy—N. B. Nairn.

(iv) Structure of New South Wales Legislative Assembly 1856-1900—A. W. Martin.

(v) Work towards a Survey of Local Government in the Sydney area. Analysis of replies to questionnaires; interviews; collection of material from most councils in Sydney area—R. E. Atkins.

Publications:


Philosophy.

(i) Language and the theory of information—C. L. Hamblin. (Thesis for degree of Doctor of Philosophy of the University of London being rewritten for submission later in 1956.)
(iii) A study of the concept of “location”—D. C. Stove.
(v) The logic of “questions”, and its use in formulating the foundations of the theory of information—C. L. Hamblin.
(vi) The empirical meaning of concepts used in the formulation of the general theory of relativity, and its extensions by Eddington—C. L. Hamblin.
(vii) Logic and calculating machines—C. L. Hamblin.

Publications:


Newcastle University College.
Department of Arts.

Classics.

(i) Preparation of a study of Latin prose and verse—J. Duhigg.
(ii) Aspects of the reigns of Augustus and Tiberius—G. V. Sumner.

Economics.

(i) The Australian tariffs in the post-war period—M. Bernasek.
(ii) Survey of hire purchase in Australia since 1930 (with special reference to the Newcastle and Hunter region)—B. J. Gordon.
(iii) Liquidity, the money supply and investment in the Australian economy, 1929-1955—R. W. Peters.
(iv) Survey of flood losses in the Hunter Valley—C. C. Renwick.
(v) Economic history of Newcastle: a study undertaken with honours students of the Department.
(vi) Survey of Maitland floods—C. C. Renwick.
(vii) Method of calculating a flood-cost index—C. C. Renwick.

Publications:


English.

(i) Literature and truth to life—a study of changing ideas in the relationship of literature to life—Robin K. Iverach. (Thesis being prepared for submission to the University of Sydney for the degree of Master of Arts.)
(iii) The doctrine of the whole in twentieth century American criticism, with specific reference to the controversy between the "New Critics" and the "Neo-Aristotelians"—Robin K. Iverach.
(iv) A study of three Australian poets—D. C. Muecke.
(vi) Continuation of work on Henry James—D. C. Muecke.

Publications:


French.

(ii) Some Italian sources for *La Pucelle d’Orleans*—K. H. Hartley.
Geography.


(ii) Land utilisation in the lower Hunter Valley—K. W. Robinson.

(iii) Final revisions are being made on the manuscript and maps of a regional geography, *Australia, New Zealand and the South-West Pacific*, which is to be published by the University of London Press—K. W. Robinson.

(iv) Heavy industry in Australia—K. W. Robinson.

(v) An investigation into the regional variety of moisture problems in Australia—A. D. Tweedie.

(vi) An investigation into the climatic variety of the Hunter River Valley—A. D. Tweedie.

(vii) An investigation into the geography of the coal mining industry of New South Wales—M. G. A. Wilson.

Publications:—


German.


(vii) Albert Schneider, Genevieve de Brabant dans la Littérature Allemande. O. Spindler, Erasmus (in press).

History.

(i) Irish public opinion and the Roman question 1860: with some Australian reflections—J. J. Auchmuty.
(ii) History of Australian pearling industry—J. P. S. Bach.
(iii) International law and organization—G. A. Cranfield.

Publications:

(iii) Lord Acton's Morality: Theory and Practice. J. J. Auchmuty, Bulletin of the Faculty of Arts, Alexandria University, 6 and 7.

Philosophy.

(i) Relations between theories of meaning and ontology, with special reference to the notion of "meaning as use" and the contention that metaphysics is senseless—C. F. Presley.
(ii) Sir Francis Bacon: his method for the sciences, and the influence of his work upon the development of the sciences in the seventeenth century—C. F. Presley.

Publications:

### Expenditure

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UNIVERSITY OF TECHNOLOGY
TO 30th JUNE, 1956.

FUNDS.

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### THE NEW SOUTH WALES STATEMENT OF BALANCES

#### LIABILITIES.

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**BALANCES—**

- Special Purposes Funds (Research)—(As per Statement "A" attached) | 135,249 | 18 | 8 |
- Special Purposes Funds (Scholarships, Bursaries and Prizes)—(As per Statement "B" attached) | 2,378 | 7 | 7 |
- Special Purposes Funds (Other Purposes)—(As per Statement "C" attached) | 106,870 | 1 | 6 |

**GENERAL LOAN GRANTS**—(As per Statement "D" attached) | 129,498 | 7 | 9 |

**INVESTED FUNDS ACCOUNTS**—(As per Statement "E" attached) | 79,674 | 12 | 3 |

**£401,373 0 0**

---

J. P. BAXTER, Vice-Chancellor.

The books and accounts of the New South Wales University of Technology have and New South Wales University of Technology Act, 1949-1955.

In my opinion the above statement correctly sets out the financial position of the given to me and as shown by such books and accounts.

Sydney, 27th November, 1956.

†£148,520 17s. 6d. invested at Short Call or for Short Term—(See Statement "E" attached).
## Assets

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<th>Description</th>
<th>£</th>
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<th>d</th>
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E. H. DAVIS, Accountant.

been audited in accordance with the provisions of Section 43 of the Technical Education

University as at 30th June, 1956, according to the best of my information and explanations

(Sgd.) W. J. CAMPBELL,
Auditor-General of New South Wales
### STATEMENT OF TOTAL RECEIPTS AND PAYMENTS FOR

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<th>Receipts, 1955-56</th>
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<td>£510 0 0</td>
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<td><strong>£6,747 17 11</strong></td>
<td><strong>£8,272 17 10</strong></td>
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UNIVERSITY OF TECHNOLOGY
FUNDS
"B"
Prizes, Etc.)

<table>
<thead>
<tr>
<th>Payments, 1955-56.</th>
<th>Total</th>
<th>Balances Carried Forward 30th June, 1956</th>
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<tr>
<td>£ s. d.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
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<tr>
<td>551 18 11</td>
<td>737 17 4</td>
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<td></td>
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<tr>
<td>£3,906 12 5</td>
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<td>£1,987 17 10</td>
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## Statement of Total Receipts and Payments for The

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<th>Fund</th>
<th>Balances Brought Forward, 1st July, 1955</th>
<th>Receipts, 1955-56</th>
<th>Total</th>
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<td>£   s. d.</td>
<td>£   s. d.</td>
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<td>Andrews Laboratories Pty. Ltd.—Donation for Purchase of High Voltage Equipment</td>
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<td>Australian Broadcasting Commission Board—Proposed Pre-Television Social Survey</td>
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<td>Australian Leather Research Association Fellowship Grant</td>
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<td>Beetles Elliott Ltd.—Donation to Special Purposes Fund</td>
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<td>500 0 0</td>
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<td>Department of Public Works—Donation for Electric Analogy Apparatus Installations</td>
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<td>Donations from Members of Plastics Institute for Equipping School of Chemical Engineering Plastics Laboratory</td>
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<td>1,265 12 6</td>
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<td>Imperial Chemical Industries of Australia and New Zealand Research Fellowship Grant</td>
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<tr>
<td>Joint Coal Board—Donation for Equipment for School of Mining Engineering</td>
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<td>949 19 8</td>
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<td>Joint Coal Board Scholarship Trust Fund—Books for Library</td>
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<td>Joint Coal Board Grant towards Cost of Transport of Deister Coal Washing Table</td>
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<td>442 0 0</td>
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<td>Joint Coal Board—Donation for Equipment for N.S.W. University of Technology and Various Technical Colleges</td>
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<td>9,558 0</td>
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<tr>
<td>H. Jones &amp; Co.—Grant for Department of Food Technology</td>
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<td>93 7 4</td>
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<td>W. K. Kellogg Foundation—Donation towards Proposed Council for Hospital Administration Course</td>
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<td>J. H. Liddle &amp; Epstein Pty. Ltd.—Grant for Department of Food Technology</td>
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<td>44 10 0</td>
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<td>Main Roads Board—Chair of Highway Engineering</td>
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<td>Sheep Breeders’ Grant</td>
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<td>84 18 0</td>
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<td>Southern Portland Cement Ltd.—Research Fellowship Grant</td>
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£82,166 4 2 £257,204 3 2 £319,370 7 4

*Includes an amount of £8,430 16s. 1d. also appearing in Statement "D".*
### UNIVERSITY OF TECHNOLOGY FUND

#### "C"

**Purposes**

**FINANCIAL YEAR 1st JULY, 1955 TO 30th JUNE, 1956.**

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</table>

<table>
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<th>£ s. d.</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
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<td>3 0 0</td>
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<td>247 15 8</td>
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<td>...........</td>
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<td>...........</td>
<td>...........</td>
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<td>...........</td>
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<td>310 2 0</td>
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<tr>
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<td>62,811 0 0</td>
<td>84 18 0</td>
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<td>61,775 0 0</td>
<td>62,811 0 0</td>
<td>84 18 0</td>
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<td>128,224 4 11</td>
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<td>7,787 3 0</td>
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<td>106,870 1 6</td>
<td>49,217 13 7</td>
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</table>

† Includes an amount of £27,710 10s. 2d. also appearing in Statement "D".
### STATEMENT "D"

**STATEMENT OF TOTAL RECEIPTS AND PAYMENTS FOR THE FINANCIAL YEAR 1st JULY, 1955 TO 30th JUNE, 1956, AND AGGREGATE STATEMENT OF OPERATIONS SINCE THE INCORPORATION OF THE UNIVERSITY ON 1st JULY, 1949, TO 30th JUNE, 1956.**

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<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td>s.</td>
<td>d.</td>
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<tr>
<td>Balance brought forward 1st July, 1955</td>
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<td>Receipts—</td>
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<tr>
<td>Grants</td>
<td>650,000</td>
<td>0 0</td>
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<td>Vestments in N.S.W. State Treasury Books</td>
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<tr>
<td>Total Receipts</td>
<td>650,000</td>
<td>0 0</td>
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<tr>
<td>Total Receipts plus balance brought forward</td>
<td>717,342</td>
<td>18 0</td>
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<tr>
<td>Payments—</td>
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<td></td>
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<tr>
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<tr>
<td>Land</td>
<td>88,429</td>
<td>5 7</td>
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<tr>
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<td>16,024</td>
<td>6 5</td>
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<tr>
<td>Furniture</td>
<td>637,663</td>
<td>5 9</td>
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<tr>
<td>Total Payments</td>
<td>79,674</td>
<td>12 3</td>
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<tr>
<td>Balance carried forward end of year</td>
<td>717,342</td>
<td>18 0</td>
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<tr>
<td>Total Payments plus balance carried forward</td>
<td>3,297,716</td>
<td>4 2</td>
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### Schedule of Investments as at 30th June, 1956.

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<th>Description</th>
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<th>Face Value</th>
<th>Book Value</th>
<th>Maturity Date</th>
<th>Account</th>
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<td>Metropolitan Water, Sewerage and Drainage Board Incribed Stock—</td>
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<td>Loan No. 129</td>
<td>4%</td>
<td>250 0 0</td>
<td>250 0 0</td>
<td>1-3-1965</td>
<td>Frank W. Peploe Prize Fund.</td>
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<td>Loan No. 134</td>
<td>4%</td>
<td>600 0 0</td>
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<td>1-6-1965</td>
<td>Sydney Technical College Union Prize Fund.</td>
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<tr>
<td>Loan No. 136</td>
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<td>Hostel Funds.</td>
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<tr>
<td>Loan No. 138</td>
<td>4%</td>
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<td>250 0 0</td>
<td>1-9-1965</td>
<td>Simon-Carves (Aust.) Pty. Ltd. Prize Fund.</td>
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<td>Loan No. 145</td>
<td>5%</td>
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<td>B. A. Helmore Prize Fund.</td>
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<td>£171,658 7 6</td>
<td>£170,220 17 6</td>
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<td>General Investment of Funds held (Commonwealth Bonds 3% per cent., 1955-58, held as Security).</td>
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</table>


<table>
<thead>
<tr>
<th>INDEX</th>
</tr>
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<tbody>
<tr>
<td>Academic Year ... ... ... 71</td>
</tr>
<tr>
<td>Accountancy ... ... ... 220</td>
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<tr>
<td>Conversion course outline ... ... ... 225</td>
</tr>
<tr>
<td>Degree course outline (full-time) ... ... ... 220</td>
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<tr>
<td>Degree course outline (part-time) ... ... ... 223</td>
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<tr>
<td>Description of subjects ... ... ... 382</td>
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<tr>
<td>Text-book list ... ... ... 450</td>
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<td>Acquisition of land ... ... ... 27</td>
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<td>Act of incorporation of the University (as amended 1955) ... ... 14</td>
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<tr>
<td>By-laws ... ... ... 23,32</td>
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<td>Regulations ... ... ... 26,29</td>
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<td>Ad eundem and honorary degrees ... ... 20,46</td>
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<td>Administration ... ... ... 19</td>
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<td>Administrative Staff ... ... ... 61</td>
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<tr>
<td>Admission—Requirements for ... ... 81</td>
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<td>Advisory Panels ... ... ... 469</td>
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<td>Applied Biology— ... ...</td>
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<td>Basic Biology course outline ... ... 241</td>
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<tr>
<td>Degree course outline (part-time) ... ... 238</td>
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<td>Description of subjects ... ... 392</td>
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<td>Applied Chemistry ... ... 121</td>
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<td>Conversion course outline ... ... 129</td>
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<td>Degree course outline (full-time) ... ... 121</td>
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<td>Degree course outline (part-time) ... ... 124</td>
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<tr>
<td>Degree course outline (part-time) ... ... 176</td>
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<tr>
<td>Description of subjects ... ... 303</td>
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