The Royal Military College
of Australia Duntroon

Royal Military College and Faculty of Military Studies

Handbook 1978

The University of New South Wales

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Reproduced for the Royal Military College
and the University of New South Wales by
the Australian Government Publishing
Service

ISBN 0 642 03179 7

Printed by Watson Ferguson & Co., Brisbane

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Foreword

In 1967, the Department of the Army and the University of New South Wales agreed to co-operate in developing the Royal Military College into a separate autonomous degree-conferring body within a period of ten years. The College entered into an affiliation with the University in 1968 and the University established the Faculty of Military Studies at Duntroon.

In March 1974 the Minister for Defence announced that the Government had decided to establish an Australian Defence Force Academy at Duntroon on a site adjacent to the Royal Military College.

The Minister and the University extended the Agreement in January, 1977, and developments under the Agreement are now directed towards the proposed new academy.

The Royal Military College of Australia, Duntroon

The Royal Military College

The Origins and Development

The idea that Australia should have its own military college received serious consideration after the federation of the six Australian colonies in January 1901. In 1902 the first commander of the Australian Military Forces, Major-General Sir Edward Hutton, recommended that a military college be established along the lines of the United States Military Academy at West Point, the Royal Military College Kingston in Canada, and of the Great Public Schools of England. The Defence Act of 1909 which introduced compulsory military training for home defence also made provision for the establishment of a military college. Before the Defence Act came into operation the Government had invited Field-Marshal Lord Kitchener to visit Australia and advise it on the defences of the Commonwealth. Among the recommendations of Kitchener's comprehensive report of 1910 was that a college should be established for the training of officers of the permanent military forces.

The Government then instructed Colonel William Throsby Bridges, the Australian representative on the Imperial General Staff in London, to visit and report on military colleges in England, Canada and the United States with a view to setting up a college suited to Australian requirements. Colonel Bridges reported to the Minister for Defence in June 1910, and soon afterwards his recommendations were accepted. He was given the task of founding the new college and appointed to be its first commandant with the rank of Brigadier-General.

The Government decided that the college should be located near the planned Federal Capital. Bridges chose the site at Duntroon, a former sheep station, which had been taken up by the Sydney merchant, Robert Campbell, in 1825. The Government at first leased and later purchased Duntroon House and 370 acres of the property from the Campbell family. By June 1911 the essential buildings had been constructed at Duntroon, the college staff appointed, and the first intake of 32 Australians and 10 New Zealanders admitted. On 27th June, the Governor-General, Lord Dudley, opened the college, and announced that it would be called the Royal Military College of Australia.

General Bridges based the College curriculum on that of the United States Military Academy. It was designed for a four-year course, half of which would be devoted to military and half to academic studies. The first course was curtailed after the outbreak of war in August 1914, and the first intake of cadets graduated specially for war service. The courses of the next three intakes were shortened also.

The majority of the graduates from the first four intakes (1911-14) served overseas with the A.I.F. or the N.Z.E.F. Forty of the 117 Australian graduates died in the Great War, seventeen of them at Gallipoli. Major-General Sir William Throsby Bridges, the first commandant, also died at Gallipoli while in command of the A.I.F.

The four-year course resumed at the College after the war. The College passed through a difficult period in the 'twenties, when there was general apathy towards military matters. Intakes were low, and the small numbers of graduates in the late 'twenties included officers for the Royal Australian Air Force as well as for the Army. During the depression the College was closed at Duntroon, and from 1931 to 1936 it was located at Victoria Barracks, Sydney. When it re-opened at Duntroon in February 1937 it was in new and permanent buildings.

During the 1939-45 war there were many changes made to the curriculum. The course was reduced to three years' duration, then to two. Additional special entry classes were admitted to the College for six, nine and 12 months, and Duntroon became a centre for other military activities in addition to those of the College. By 1943 the improved military situation made it possible for the College course to be extended, and a three-year curriculum was introduced for the 1944 intake.

Planning for the post-war period included a long range policy for the development of the Royal Military College. In 1944 a committee under Major-General G. A. Vasey and in 1946 another under Lieutenant-General Sir Sydney Rowell reported on the College. These Committees recommended that the course should be a four-year course divided between military and academic work; that the curriculum should allow a proportion of the cadets to concentrate on a liberal rather than a scientific education; that the course should lead to a civil degree, or part thereof; and that the curriculum should be reviewed every two years by a standing committee.

A revised four-year course was introduced for the 1947 intake. This included alternative academic courses in Arts or Science. Under the guidance of the Standing Committee on the Royal Military College Curriculum, which was created as a statutory body in 1951, the development of the academic courses proceeded.

By 1958 the College offered three courses—Arts, Science and Engineering, each at two levels. These courses enabled selected graduates to obtain exemptions up to the equivalent of half the appropriate civil courses at universities or institutes of technology. The military curriculum was planned to achieve the best balance between the short-term requirements of a junior regimental officer and the broader foundation necessary for those who would progress to the higher ranks of the Army. The bases of the curriculum were the military skills and the knowledge of all arms and services required by an infantry platoon commander and the study of additional subjects appropriate to a general military education. Throughout the course, emphasis was placed on the development of character and leadership qualities and of fostering strong motivation towards the Service.

Following a later study on the production of officers, Army Headquarters decided that appropriate changes should be made to the academic courses in order that all graduates of the College might have opportunities to gain degrees, in either the humanities or technology. In 1962 the matter was placed before the Standing Committee, and the subsequent deliberations resulted in the establishment of an Advisory Board on Academic Studies, comprising members drawn from seven of the universities, whose task was to design new post-matriculation courses in arts, applied science and engineering. The new courses were introduced in 1964 and were designed to be presented at the level of a bachelor's degree; the courses were available also at a lower, or 'diploma', level.

Each course was conceived as a whole: a cadet had to pass in both his military and academic studies to graduate from the College. He had also to meet the standards required in the qualities of leadership. The military curriculum was the same for all cadets, and was founded on the bases already established.

After consulting with the Standing Committee, the Minister for the Army approached the University of New South Wales in 1966 regarding the possibility of an affiliation between the University and the Royal Military College. In due course the University put forward proposals which, on the recommendation of the Standing Committee, were accepted by the Minister. The agreement was formally concluded on 21st July,

1967. Under its terms, the University and the Department of the Army undertook to co-operate in developing the Royal Military College with a view to its becoming a separate autonomous degree-conferring body within a period of 10 years. To this end the University set up the Faculty of Military Studies at Duntroon responsible for the development and conduct of courses in arts, applied science and engineering and leading to degrees of the University. The agreement also established the Interim Council of the Royal Military College, which replaced the Standing Committee.

The courses in the new Faculty of Military Studies commenced for the 1968 intake. The first degrees were awarded at Duntroon by the University at a Graduation Ceremony following the Graduation Parade in December 1971.

Since the announcement in 1974 of the Government's intention to establish an Australian Defence Force Academy, the direction of the development at the Royal Military College has necessarily changed. The Minister for Defence and the University have extended the original agreement accordingly.

The Charter

The Charter of the Royal Military College is to train cadets for careers in the service of the Crown as officers in the Australian Army. Its aim is to give each cadet the knowledge necessary to fit him to enter upon such a career, and to foster in him the moral and mental qualities on which leadership depends. The course of instruction is designed to:

(a) promote a sense of honour and loyalty, duty and responsibility; inculcate habits of discipline and soldierly conduct; and to give a correct understanding of the place of the Armed Services in the Australian nation;

(b) provide a balanced and liberal education in the Arts and Sciences, taking into account the special needs of the Service and the aptitude of the cadet;

(c) develop a capacity for clear and logical thought and expression;

(d) give a sound military education in the science and principles of war; and

(e) instruct the cadet in the military skills and techniques of modern warfare required of the junior regimental officer.

Agreement between the University of New South Wales and the Minister for Defence

(17th January, 1977)

Preamble

In considering the extension of the Agreement entered into by the Minister for the Army and the University of New South Wales on 21st July, 1967, the Minister for Defence and the University of New South Wales have taken into account the intention of the Commonwealth Government, announced in March, 1974, to establish a separate autonomous degree-conferring Defence Force institution in the place of the three existing Service colleges. This intention was acknowledged by the Council of the University of New South Wales in May, 1974 when it resolved:

> That in the light of the announcement by the Australian Government that it intends to set up an Australian Defence Force Academy to begin operation in 1979 at the earliest, the Council authorises the Vice-Chancellor and Principal to explore ways in which the intention of the agreement between the Minister for the Army and the University 'to develop the College into a separate autonomous degree-conferring body' can now be achieved and to make appropriate recommendations to Council.

On 19th October, 1976 the Minister for Defence advised the Vice-Chancellor of the University of New South Wales of the Commonwealth Government's approval in principle to establish by legislation a Defence Force Academy as an autonomous university on a new site at Duntroon adjacent to the Royal Military College.

While it is not now intended to develop the Royal Military College into a separate autonomous degree-conferring body as originally envisaged, the Minister for Defence and the University of New South Wales, as the parties to the Agreement, acknowledge the satisfactory results already achieved and, in agreeing to extend the original Agreement, recognise the special nature of the College and the continuing need for co-operative military and academic endeavour.

Aim of the Agreement

1. The University of New South Wales (hereinafter called 'the University') and the Minister for Defence (hereinafter called 'the Minister') agree that they will continue to co-operate in the operation and development of the Faculty of Military Studies (hereinafter called 'the Faculty') now located at the Royal Military College (hereinafter called 'the College') and those parts of the College which support the academic activities of the Faculty. This development shall be within the context of the Commonwealth Government's stated intention to establish a separate autonomous degree-conferring Defence Force institution (hereinafter called 'the Institution') and its approval in principle to establish by legislation a Defence Force Academy as an autonomous university on a new site at Duntroon adjacent to the College.

General Conditions

2. This Agreement shall continue until the parties to it agree that the Institution has commenced to operate or until 31st December, 1982, whichever is the earlier,and, if necessary, shall be renegotiated to extend until the parties agree that the Institution has commenced to operate.

3. To ensure effective working of this Agreement, the Minister and the Vice-Chancellor of the University will consult as necessary and they will arrange for regular consultation between officers of the Department of Defence (hereinafter called 'the Department'), and of the University at the appropriate level.

4. The Minister will keep the University informed on the planning and development of the Institution, particularly as these matters relate to the activities of the Faculty.

5. The Department and the University will consult to develop functions and procedures at the College which are suited to the requirements of the Institution, and to the continuing needs of the College.

6. The University will continue to accept responsibility for the teaching and standards of academic courses at the College, and for all aspects of the academic work of the College, including research.

Interim Council

7. The parties agree to the continued operation of the Interim Council, established under the original Agreement, but with the following membership:

- the Commandant (Chairman);
- the Vice-Chancellor of the University or a Pro-Vice-Chancellor as his nominee;
- three professors nominated by the Minister from universities other than the University;
- not more than three persons prominent in civil life, other than in the academic field, nominated by the Minister;
- five members of the University to be nominated by the University after receiving advice from the Professorial Board;
- a nominee of the Federal Minister for Education;
- two civilian officers of the Department nominated by the Minister;
- the Dean of the Faculty;
- the Chairman of the Faculty;
- a professor of the Faculty elected by the professors of the Faculty;
- three members of the teaching staff of the Faculty, one from each of the Arts, Engineering and Science groups of departments, elected by members of the full-time teaching staff of the respective groups of departments;
- a full-time undergraduate student of the Faculty elected by the undergraduate students of the Faculty; a postgraduate student of the Faculty elected by the postgraduate students of the Faculty; provided that in either case a person who is a full-time member of the staff of the Faculty shall be ineligible for election;

- a member of the non-teaching staff of the Faculty elected by the non-teaching staff of the Faculty;
- two Army members nominated by the Chief of the General Staff;
- a nominee of the New Zealand Army nominated by the Chief of the General Staff of the New Zealand Army;
- the Director of Military Art;
- the Director of Army Training;
- the Commanding Officer of the Corps of Staff Cadets; and
- a member of the military instructional staff of the College nominated by the Commandant.

8. Members of the Interim Council other than those who hold office *ex officio* shall normally hold office for a period not exceeding two years, and shall be eligible for re-appointment or re-election.

9. When an election is required, the procedures to be followed shall be generally in accordance with the provisions of the relevant University by-laws at the time, and shall be determined by the Returning Officer in consultation with the Dean. The Returning Officer shall be the Registrar of the University or his nominee.

10. The Interim Council shall advise the parties to the Agreement:
- on the progressive development of the College;
- on accommodation and other facilities required for the activities of the College;
- on any other matter relating to the College.

It shall report at least annually to the University and to the Minister.

11. The Interim Council shall have power to appoint committees for specific purposes, and such committees may co-opt members, but the appointment of committees shall not in any way affect the authority of the Interim Council to advise the University and the Minister on any matter relating to the College. In particular, there shall be an Executive Committee of the Interim Council, which shall have such duties and responsibilities as the Interim Council determines, and which shall report regularly to that Council.

Faculty of Military Studies

12. The Faculty established at the College by the University shall continue in existence and shall consist of:
- the Vice-Chancellor of the University;
- a Pro-Vice-Chancellor of the University nominated by the Vice Chancellor;
- the Dean of the Faculty;
- the Commandant of the Royal Military College;
- the Professors, Associate Professors, Senior Lecturers and Lecturers in the subjects for which the Faculty is responsible;
- the Director of Army Training;
- the Director of Military Art;
- the Commanding Officer of the Corps of Staff Cadets;
- the Chief Instructor;
- the Heads of Schools in the University whose disciplines are included in the curricula of the College courses under the control of the Faculty;
- such other persons including students having appropriate qualifications as the University Council may appoint thereto;
- the Faculty Secretary;
- the Registrar of the University; and
- a nominee of the Registrar of the University.

13. The Faculty shall continue to operate in the manner prescribed in the by-laws made under The University of New South Wales Act 1968. In addition the Faculty shall report to the Interim Council on such matters as the Council requests, and may advise the Council on such matters as it considers desirable.

Staff

14. Subject to the provisions of The University of New South Wales Act 1968, the University will continue to employ all academic and teaching and general staff in its employment at the College at the date of this Agreement. This employment will be

under the same terms and conditions as under the original Agreement and subsequent exchanges of letters except that:

- where the University has previously undertaken to employ staff until the expiry of the original Agreement, employment by the University will now continue until whichever date is determined in accordance with Clause 2;
- where the University has previously undertaken to consider extending employment until the expiry of the original Agreement, it will now consider extending employment until whichever date is determined in accordance with Clause 2.

15. The University will after consultation with the Department establish such staff positions as it considers necessary to achieve the aims of this Agreement. All appointments to the staff of the Faculty after the date of this Agreement shall be made by the University in accordance with and subject to the provisions of The University of New South Wales Act 1968 and, unless any other condition is imposed by the University, will continue until whichever date is determined in accordance with Clause 2. Members of the academic and teaching staff so appointed will be appointed under terms and conditions similar to those which apply to relevant classifications in other faculties in the University; members of the general staff so appointed will be appointed under terms and conditions approved by the University in consultation with the Department.

16. The Minister undertakes to ensure that, when the Institution commences to operate, all staff of the Faculty shall be employed by the Institution under conditions not less favourable than those which the members of staff enjoyed in the University.

17. Staff of the Department seconded to the University at the date of this Agreement will continue to be seconded and, subject to agreement between the Department and the University, further staff of the Department may be seconded to the University for such duties in the Faculty as the University may require them to perform. The University may terminate these secondments at any time after consultation with the Department. If these members of staff carry out duties to the satisfaction of the University at a higher level than that of their classification and are qualified to do so, the Department will on certification by the University pay an appropriate higher rate of remuneration to such staff.

18. The University will follow its normal appointment procedures, including those relating to advertising, receipt of applications and processing, except that for professorial and associate professorial appointments the University will appoint a selection committee which normally will consist of:

- the Vice-Chancellor (Chairman);
- the Chairman of the Interim Council;
- a Pro-Vice-Chancellor;
- the Chairman of the Professorial Board;
- the Dean;
- two members of the University Council;
- one member of the Interim Council nominated by that Council;
- one Member of the Interim Council, being a civilian officer of the Department, nominated by the Minister; and
- three members of the Professorial Board nominated by the Board.

Supporting Services

19. The Department will co-operate with the University in the progressive development of financial and administrative procedures appropriate to an autonomous institution.

20. While such procedures are being developed, the Department will, after consultation with the University, continue to provide such equipment, materials, and supporting services associated with teaching, research and administration in the Faculty as are mutually agreed upon.

21. The Department will, after consultation with the University, provide such buildings as are necessary and appropriate to accommodate the teaching, research and administrative activities of the Faculty, and develop an appropriate environment for all the activities of the College.

Library

22. The Department and the University will co-operate in an examination of the College Library. The University will proceed at an early date to the appointment of a Librarian, under conditions to be agreed between the parties, to undertake the development of the existing library and the planning and establishment of the library of the Institution.

Financial Arrangements

23. The Department will reimburse the University the direct salary and associated salary costs incurred by the University in respect of the staff of the Faculty appointed within the establishment limits agreed with the Department.

24. Subject to agreement the Department will reimburse the University the costs associated with equipment, materials and supporting services provided by the University, and such other charges as may be agreed upon.

25. As a matter of procedure the reimbursement referred to in Clauses 23 and 24 will be achieved by an advance of funds by the Department to the University on an agreed basis.

26. The Department will contribute to the University an amount to cover such other fees relating to the use of the University's facilities at Kensington as may be agreed.

27. Course fees will not be payable to the University by cadets or other members of the Defence Force enrolled in the Faculty to meet Service requirements.

28. Exemptions from fees for other classes of students may be agreed between the parties.

29. The Minister undertakes to meet the costs to the University of any liability or continuing liability that the University may incur as a result of this Agreement and will indemnify the University against any action arising from the use of the College including negligence of staff and defect in property.

Provisions relating to the period of transition when an Australian Defence Force Academy is established:

Before the Government's proposals for an Australian Defence Force Academy had been decided upon, the University, in anticipation of the arrangements necessary at the time that a new institution would replace the Royal Military College, agreed to the following provisions:

1. Every student who has enrolled in the Faculty of Military Studies before 1 January of the year in which the Royal Military College becomes a separate autonomous institution and who has completed at least half of the requirements for a degree by that date should be permitted to elect to take his degree from the University of New South Wales, provided that he completes all the requirements for the degree within two calendar years from the date.

2. A joint liaison committee composed of members of the University and members of the new institution should be established to consider special cases of students in the transition period.

If, in the event, a date other than 1 January is chosen for the establishment of the new institution, the spirit of the first provision would be preserved and the transition period defined so as to be nearer to two years than one. For the purpose of the first provision, a postgraduate student who submits his thesis by the terminal date would be deemed to have completed all the requirements for his degree.

It is expected that the provisions will now be interpreted in the light of the Agreement between the University of New South Wales and the Minister for Defence of 17th January 1977.

The Interim Council

Members

Chairman

Major-General A. L. Morrison, DSO, MBE, rcds, psc,
Commandant, Royal Military College.

Members

Mr N. J. Attwood, BCom *Melb.*,
First Assistant Secretary (Personnel Administration and Policy),
Department of Defence.

Major-General D. S. Baldwin, AO, jssc, psc,
Chief of Personnel, Department of Defence (Army Office).

Professor J. C. Burns, MSc *N.Z.*, BA *Camb.*, PhD *Manc.*,
Dean of the Faculty of Military Studies.

Professor H. Burton, CBE, BA *Qld.*, MA *Oxon. & Melb.*,
Hon LLD *Qld.*, FACE, FASSA,
Emeritus Professor of the Australian National University.

Colonel A. Clunies-Ross, MBE, jssc, psc, psc(US),
Director of Military Art, Royal Military College.

Lieutenant-Colonel R. G. Curtis, MC, psc,
Chief Instructor, Royal Military College.

Dr E. Dennis, MSc *Adel.*, PhD *A.N.U.*, Grad AIP,
Member elected by the science group of departments in the Faculty of Military Studies.

Major-General D. F. W. Engel, OBE, BE *Syd.*, FIEAust., rcds, psc,
Chief of Material—Army,
Department of Defence (Army Office).

Colonel R. S. Flint, psc,
Director of Army Training, Department of Defence.

The Honourable Mr Justice R. W. Fox,
Chief Judge of the Supreme Court of the Australian Capital Territory.
Member nominated by the Minister for Defence.

Professor E. P. George, BSc PhD *Lond.*, DSc *N.S.W.*, FInstP.,
Head, School of Physics,
University of New South Wales.

Professor R. M. Golding, MSc *Auck.*, PhD *Camb.*, FNZIC, FInstP, FRACI,
Head, Department of Physical Chemistry,
University of New South Wales.

Professor H. E. Green, ME *Adel.*, PhD *Ohio State*, CEng, FIEAust, MIEE, SMIEEE, jssc,
Chairman of the Faculty of Military Studies.

Sir Edwin Hicks, CBE,
Member nominated by the Minister for Defence.

Professor W. E. Kasper, Dipl. Volkswirt *Saarbrucken*, Dr. rer.pol. *Kiel*,
Member elected by the professors of the Faculty of Military Studies.

Mr M. S. Kelson,
Member elected by the non-teaching staff of the Faculty of Military Studies.

Professor D. M. McCallum, BA *Syd.*, MA BPhil *Oxon.*,
Head, School of Political Science,
University of New South Wales.

Professor D. W. McElwain, ED, MA *N.Z. & Melb.*, PhD *Lond.*, EBPsS, FAPsS,
Professor of Psychology, University of Queensland.

Lieutenant T. J. McKenna, BSc(Mil) *N.S.W.*,
Member elected by the postgraduate students of the Faculty of Military Studies.

Mr D. M. Morrison,
Acting Deputy Secretary, Department of Education.

Lieutenant-Colonel R. J. Moyle, jssc, psc, RAAC,
Commanding Officer, Corps of Staff Cadets.

Professor R. H. Myers, CBE, MSc PhD *Melb.*, Hon LLD *Strath.*, FIM, FRACI, FAIM, MAusIMM,
Vice-Chancellor, University of New South Wales.

Colonel R. K. G. Porter, OBE, jssc, G,
Deputy Head and Army Liaison Officer,
New Zealand Defence Liaison Staff.

Professor C. G. F. Simkin, MA DipSocSc *N.Z.*, DPhil *Oxon.*,
Professor of Economics, University of Sydney.

Dr J. Sneddon, BE *N.S.W.*, BSc(Tech) *N'cle (N.S.W.)*, PhD *N.S.W.*, MIEAust.,
Member elected by the teaching staff of the engineering group of departments in the Faculty of Military Studies.

Mr T. E. Sullivan, Dip PA, AASA,
Assistant Secretary Resources Planning (Army),
Department of Defence.

Corporal J. F. Truscott,
Member elected by the undergraduate students in the Faculty of Military Studies.

Professor H. R. Vallentine, BE *Syd.*, MS *Iowa*, ASTC, FIEAust., MASCE,
Professor of Civil Engineering,
University of New South Wales.

Sir William Vines, CMG,
Member nominated by the Minister for Defence.

Associate Professor W. H. Wilde, MA DipEd., *Syd.*, MACE,
Member elected by the teaching staff of the arts group of departments in the Faculty of Military Studies.

Professor A. H. Willis, DSc(Eng) *Lond.*, CEng, FIMechE, FIEAust, MemASAE, WhSc,
Pro-Vice-Chancellor,
University of New South Wales.

Secretary

Mr R. W. O. Pugh, BE *Syd.*, BA *A.N.U.*, psc,
Registrar, Royal Military College.

Terms of Reference

(Revised March 1977)

1. The Interim Council of the Royal Military College is established under the agreement between the Minister for Defence and the University of New South Wales.

2. The Interim Council of the Royal Military College shall consist of:

- the Commandant (Chairman);
- the Vice-Chancellor of the University or a Pro-Vice-Chancellor as his nominee;
- three professors nominated by the Minister from universities other than the University;
- not more than three persons prominent in civil life, other than in the academic field, nominated by the Minister;
- five members of the University to be nominated by the University after receiving advice from the Professorial Board;
- a nominee of the Federal Minister for Education;
- two civilian officers of the Department nominated by the Minister;
- the Dean of the Faculty of Military Studies;
- the Chairman of the Faculty;
- a professor of the Faculty elected by the professors of the Faculty;
- three members of the teaching staff of the Faculty, one from each of the arts, engineering and science groups of departments, elected by members of the full-time teaching staff of the respective groups of departments;
- a full-time undergraduate student of the Faculty elected by the undergraduate students of the Faculty; a postgraduate student of the Faculty elected by the postgraduate students of the Faculty; provided that in either case a person who is a full-time member of the staff of the Faculty shall be ineligible for election;
- a member of the non-teaching staff of the Faculty elected by the non-teaching staff of the Faculty;
- two Army members nominated by the Chief of the General Staff;
- a nominee of the New Zealand Army nominated by the Chief of the General Staff of the New Zealand Army;
- the Director of Military Art;
- the Director of Army Training;
- the Commanding Officer of the Corps of Staff Cadets; and
- a member of the Military instructional staff of the College nominated by the Commandant.

3. Members of the Interim Council other than those who hold office *ex officio* shall normally hold office for a period not exceeding two years, and shall be eligible for re-appointment or re-election.

4. When an election is required, the procedures to be followed shall be generally in accordance with the provisions of the relevant University by-laws at the time, and shall be determined by the Returning Officer in consultation with the Dean. The Returning Officer shall be the Registrar of the University or his nominee.

5. The Interim Council shall advise the University and the Minister:

- on the progressive development of the College,
- on accomodation and other facilities required for the activities of the College,and
- on any other matter relating to the College.

It shall report at least annually to the University and to the Minister.

6. The Interim Council shall examine and report on such matters as are referred to it by the Minister, the University, the Faculty of Military Studies and the Commandant.

7. The Interim Council shall have power to appoint committees for specific purposes, and such committees may co-opt members, but the appointment of committees shall not in any way affect the authority of the Interim Council to advise the University and the Minister on any matter relating to the College. In particular, there shall be an Executive Committee of the Interim Council, which shall have such duties and responsibilities as the Interim Council determines, and which shall report regularly to that Council.

8. The Executive Committee shall consist of:
- the Commandant (Chairman),
- the Vice-Chancellor of the University or a Pro-Vice-Chancellor as his nominee,
- one of the professors from universities other than the University,
- one of the members of the University nominated by the University,
- one of the two civilian officers of the Department nominated by the Minister,
- the Dean of the Faculty of Military Studies,
- one of the two Army members nominated by the Chief of the General Staff,
- the nominee of the New Zealand Army, and
- the Director of Military Art.

9. The Interim Council shall meet thrice a year, normally in the fourth week of March, of June and of September, and on such other occasions as may be considered necessary.

Rules of Procedure

1. The Interim Council shall meet normally in the fourth week of March, of June and of September, and on such other occasions as may be considered necessary. Ordinarily meetings will be convened on two months' notice. Extraordinary meetings may be called by the Chairman on one month's notice; and he shall call an extraordinary meeting on the written requisition of any four members, which requisition shall state the objects of the meeting. All papers relevant to a meeting will be dispatched to members two weeks beforehand.

2. The Commandant, or, in his absence, the officer administering command of the Royal Military College, shall preside at meetings of the Interim Council.

3. All questions before the Interim Council shall be decided by a majority vote by the members present. The Chairman shall have a vote and in case of equality of votes, a second or casting vote. At any meetings of the Interim Council, 10 members shall form a quorum.

4. The proceedings of the Interim Council shall be presented as a report. The report shall be circulated in draft to the members for confirmation after the meeting, and upon their approval shall be signed by the Chairman as the true report of the meeting.

5. The Registrar of the Royal Military College shall be Secretary of the Interim Council and shall be responsible for the preparation and despatch of all material relevant to its meetings, and for the reproduction of the Interim Council's reports.

6. The Executive Committee of the Interim Council shall meet normally in the first week of March, June and September of each year, and on such other occasions as may be considered necessary.Meetings will be convened on one month's notice, and all papers relevant to the meeting despatched two weeks beforehand.

7. The Commandant, or, in his absence, the officer administering command of the Royal Military College, shall preside at meetings of the Executive Committee.

8. All questions before the Executive Committee shall be decided by a majority vote by the members present. The Chairman shall have a vote and, in the case of equality of votes, a second or casting vote. At any meeting of the Executive Committee five members shall form a quorum.

9. The proceedings of the Executive Committee shall be recorded as minutes. The minutes shall be circulated in draft to members for confirmation after each meeting and, upon their approval, shall be signed by the Chairman as a true record of the meeting.

10. The minutes of the Executive Committee shall be circulated to all members of the Interim Council as soon as practicable after each meeting.

11. The Executive Committee shall decide upon the agenda for the plenary meetings of the Interim Council. The Registrar of the Royal Military College shall be the Secretary of the Executive Committee and be responsible for preparing the agenda as directed by the Executive Committee.

12. Any business which requires the attention of the Interim Council out of session will normally be dealt with by correspondence. The Secretary will be responsible for the conduct of such business as directed by the Executive Committee or the Commandant. Whenever expedient, memoranda should be in the form of circulars and brief minutes, over the Secretary's signature.

Staff of the Royal Military College 1978

Military Staff

Commandant
Major-General A. L. Morrison, DSO, MBE, rcds., psc

Deputy Commandant and Director of Military Art
Colonel A. Clunies-Ross, MBE, jssc, psc, psc(US)

S02 (Co-ordination)
Major A. Harkness, BA *A.N.U.*, psc, pl, RAA

Student Counsellor
Lieutenant-Colonel H. F. Buckham, BCom, *Qld.*, Dip Psych *Qld.*, MAPsS, AA Psych Corps

S02 (Projects)
Major P. R. Florance, Dip Mil Stud, RACT

The Corps of Staff Cadets

Commanding Officer
Lieutenant-Colonel R. J. Moyle, jssc, psc, RAAC

Second-in-Command
Major M. G. Langley, MC, psc, RAA

Adjutant
Captain J. J. A. Wallace, BA (Mil), *N.S.W.*, RA Inf

Officer Commanding the Sovereign's Company
Major R. J. McKinnon, B Tech (CEng) *Adel*, MIEAust, qtc, RAE

Officer Commanding Alamein Company
Major K. G. Gallagher, RA Inf

Officer Commanding Kapyong Company
Major P. E. Green, BA, *N.S.W.*, RA Inf

Officer Commanding Kokoda Company
Major R. V. McEvoy, RAA

Officer Commanding Long Tan Company
Major D. J. Halmarick, Dip Mil Stud, RAAOC

Officer Commanding Romani Company
Major R. N. Buchanan, RA Sigs

Regimental Sergeant-Major
Warrant Officer Class 1 A. J. Bretherton, RAA

Military Training Wing

Headquarters

Chief Instructor
Lieutenant-Colonel R. G. Curtis, MC, psc, RA Inf

Training Development
Captain T. A. Robertson, RA Inf

Tactics Team

Senior Instructor
Major K. C. Ashman, psc, RAAC

Instructor Armour
Major E. T. Finnimore, psc, RNZAC

Instructor Artillery
Captain P. J. Lawrence, RAA

Instructor Military Engineering
Major R. J. McKinnon, B Tech (CEng) (*Adel*) MIE Aust, qtc, RAE

Instructor Signals
Major R. N. Buchanan, RA Sigs

Instructor Infantry
Major A. H. Jensen, psc, RA Inf

Instructor Aviation
Captain W. H. Davies, BA (Mil), *N.S.W.*, pl, AA Avn

Writing Team
Major G. A. H. Dugdale, psc, RA Inf
Captain V. J. Gibbons, Dip Mil Stud, RAA

Field Training Team

Senior Instructor
Major A. H. Jensen, psc, RA Inf

Instructor Topography and Weapon Training
Captain G. D. Spinkston, RA Inf

General Studies Team

Senior Instructor (and Instructor Staff Duties, Strategic Studies and Intelligence)
Major G. B. Bateman, psc, The Queen's Regiment

Instructor Peace Administration and Military Law
Captain R. W. Flynn, Dip Mil Stud, RA Inf

Instructor NZ Peace Administration and NZ Mil Law
Major E. T. Finnimore, psc, RNZAC

Instructor Military History, Training and Methods of Instruction
Captain R. J. Margetts, RA Inf

Instructor Communication Skills and Current Affairs
Captain D. J. Carpenter, RAAEC

Instructor Logistics
Major D. J. Halmarick, Dip Mil Stud, RAAOC

Instructor Army Health
Major B. R. C. Daniel, ED, MB, BS (*Syd*) RAAMC

Officer Development and Skills

Instructor Drill and Ceremonial
Captain J. J. A. Wallace, BA (Mil), *N.S.W.*, RA Inf

Instructor Physical Training
Captain L. W. Greenfield, RAA

Instructor Service Etiquette
Major P. E. Green, BA *N.S.W.*, RA Inf

Instructor Leadership
Major R. V. McEvoy, RAA

Administration

SO1 Administration
Lieutenant-Colonel J. C. Harding, psc, RA Inf

SO2 Personnel
Major B. F. Kelly, MBE, qs, RA Inf

SO2 Logistics
Major S. G. Chamarette, BEc *W. Aust*, RAAOC

Finance and Civil Secretary
Mr K. J. Rosenburg

Medical Officer
Major B. R. C. Daniel, ED, MB, BS, *Syd.*, RAAMC

Archivist
Colonel L. H. R. Fuhrman, psc (RL)

Chaplains

Church of England
Chaplain P. R. Dillon, HDA, ThL, RAA, ChD

Roman Catholic
Chaplain H. J. Ranger, RAA ChD

United Churches
Chaplain F. P. McMaster, ED, DipRE, RAA ChD (part-time)

Uniting Church
Chaplain J. D. Wessel, RAA ChD (part-time)

Academic Staff

Administration

Dean
Professor J. C. Burns, MSc *N.Z.*, BA *Camb.*, PhD *Manc.*

Registrar
R. W. O. Pugh, BE *Syd.*, BA *A.N.U.*, psc

Assistant Registrars
P. H. Kitney, ANZIM, psc
Marcia A. Daniel, BA *Syd.*
Sally A. Phillips, BA *Monash*

Administrative Officer
J. D. Harverson, BSc *N.S.W.*, AAIFST, psc

Services Officer
P. F. Kowald, BA DipEd *Syd.*

Faculty Administration Programmer
R. P. May, AACS

Department of Economics

Professor of Economics and Head of the Department
W. E. Kasper, Staatl. geprüfter Übers. *Saarbr.*, Dipl.-Volksw. *Saarbr.*, Dr. rer. pol. *Kiel*

Associate Professors
H. S. Hodges, BSc (Econ), Dip Ed *Lond.*, FRGS
J. Wilczynski, BSc (Econ) *Lond.*, BEd *Melb.*, MEc *ANU.*, PhD *Lond.*, DSc *N.S.W.*

Senior Lecturer
G. R. Webb, BA MCom, *Melb.*, MEc *A.N.U.*, PhD *N.S.W.*

Lecturers
A. M. M. Masih, MA *Dacca*, MA (Econ) *Manc.*, PhD *Leeds*
Vacant

Teaching Fellow
Jill E. Lester, BA *Syd.*, DipLib *N.S.W.*, BEc *Qld.*

Department of Geography

Professor of Geography and Head of the Department
B. G. Thom, BA *Syd.*, PhD *Louisiana State*

Associate Professor
E. R. Woolmington, MA *Syd.*, PhD *N.E.*

Lecturers
J. S. Burgess, MA, PhD *Cant.*
L. J. Olive, BSc *N.E.*, MSc *Tas.*
W. A. Rieger, MA *Tor.*, PhD *Syd.*

Tutor
C. Adrian, BSc *N.S.W.*, MA *Ohio State*

Teaching Fellow
A. R. Davidson, BA, *N.S.W.*

Research Assistants
G. M. Bowman, BA *Syd.*, DipTertiaryEd *N.E.*
Susanne M. Salisbury, BA A.N.U., DipEd *CCAE*

Department of Government

Professor of Government and Head of the Department
B. D. Beddie, BA *Syd.*, PhD *Lond.*, FASSA

Senior Lecturers
E. D. Daw, MA *A.N.U.*, BEc *Syd.*
W. H. Smith, BSc (Econ), MPhil *Lond.*, PhD *A.N.U.*

Lecturers
M. H. Mackerras, BEc *Syd.*
Beverley M. Male, BA, PhD *A.N.U.*

Teaching Fellow
Helen A. South, BA *A.N.U.*

Research Assistant
Jennifer J. Shapcott, MA *A.N.U.*

Department of History

Professor of History and Head of the Department
L. C. F. Turner, MA *Rand.*, FASSA, jsc

Associate Professor
J. R. Robertson, MA *W. Aust.* & *A.N.U.*

Senior Lecturers
A. J. Hill, MBE, ED, BA *Syd.*, MA *Oxon.*, MACE, psc
J. M. McCarthy, BA *Qld*, MA *N.S.W.*, PhD *A.N.U.*
R. C. Thompson, BA DipEd *Melb.*, PhD *A.N.U.*
G. P. Walsh, MA DipEd *Syd.*, MA *A.N.U.*

Tutor
Sandra J. McDonald, MA *LaT*

Teaching Fellow
K. J. Fewster, BA *A.N.U.*

Research Assistant
Margot Z. Simington, BA *N.E.*

Department of Language & Literature

Professor of English and Head of the Department
Vacant

Associate Professor and Acting Head of the Department
J. T. Laird, MA *Syd.*

Associate Professor
W. H. Wilde, MA DipEd *Syd.*, MACE

Senior Lecturer
B. G. Andrews, MA *N.S.W.*, DipEd *Syd.*

Lecturer
Vacant

Temporary Lecturer
Joy W. Hooton, BA, MPhil, *Lond.*

Research Assistant
Ann-Mari Jordens, MA *Syd.* & *Melb.*

Department of Mathematics

Professor of Mathematics and Dean
J. C. Burns, MSc *N.Z.*, BA *Camb.*, PhD *Manc.*

Associate Professor and Acting Head of the Department
A. McMullen, MA *Syd.*

Senior Lecturers
B. A. Barnes, MSc DipEd *Syd.*
N. J. de Mestre, BSc DipEd *Syd.*, MSc *W. Aust.*, PhD *N.S.W.*
T. Parkes, BSc *Manc.*, MSc *A.N.U.*

Lecturers
K. L. Byrnes, MA *Syd.*
E. A. Catchpole, BSc *Lond.*, PhD *Dund.*
D. L. Hoffman, BA *A.N.U.*

Tutor
H. H. Ling, BE *Monash*

Computer Science

Senior Lecturer
A. J. Quaine, BEE, BSc *Melb.*, MSc *A.N.U.*

Lecturers
D. H. Anderson, BSc *N.S.W.*, PhD *A.N.U.*
G. W. Gerrity, BScE, MSc *Sask.*, PhD *A.N.U.*

Department of Chemistry

Professor of Chemistry and Head of the Department
R. J. Bearman, AB *Corn.*, PhD *Stan.*, FAIC, FRACI

Associate Professor
B. Dempsey, MSc *Syd.*, BEd *Melb.*, FRACI

Senior Lecturers
D. J. McHugh, BSc *Syd.*, PhD *N.S.W.*, ARACI
E. P. Serjeant, MSc *N.S.W.*, ARACI
J. W. Tardif, MSc *Syd.*

Lecturers
N. D. Hamer, BSc *Arizona State*, PhD, *M.I.T.*
S. P. Lee, BSc *HK.*, MA, PhD, *SUNY (Stony Brook)*
R. A. Russell, BSc *Tas.*, PhD *A.N.U.*
W. G. Jackson, BSc, PhD *Melb.*

Teaching Fellow
Kin C. Ho, BSc *W.A.*, PhD *A.N.U.*

Research Scientist
B. C. Freasier, BSc, PhD, *Louisiana*

Research Officer
D. L. Jolly, BSc, PhD *Flin.*

Professional Officers
D. J. Isbister, BSc *N.S.W.*, MS *Indiana*
N. McL. Wilson, BTech, BSc, DipT *Adel.*, MIREE

Department of Physics

Professor of Physics and Head of the Department
G. V. H. Wilson, MSc *Melb.*, PhD *Monash*, DSc *Melb.*, FAIP

Associate Professor
D. E. Swan, OBE, BSc *Syd.*, BEd *Qld*, MInstP, MAIP

Senior Lecturers
D. H. Chaplin, BSc, PhD *Monash*, MAIP
D. C. Creagh, BSc DipEd *Qld*, MSc *N.E.*, & *Brist.*, PhD *N.S.W.* MInstP, FAIP
E. Dennis, MSc *Adel.*, PhD *A.N.U.*, GradAIP

Lecturers
H. R. Foster, BSc *Syd.*, MSc *A.N.U.*
D. K. Fowler, MSc *N.E.*, GradAIP
R. W. N. Kinnear, MSc *N.Z.*, GradAIP
P. Lynam, BSc *Birm*, PhD *S'ton*, MInstP

Post-doctoral Research Fellow
S. J. Campbell, BSc *Aberd.*, MSc *Salford*, PhD *Monash*, MInstP, MAIP

Teaching Fellows
L. O. Barbopolous, MSc *Sir G. Wms.*, PhD *A.N.U.*
P. Cooke, BSc *Flin.*

Department of Civil Engineering

Professor of Engineering and Head of the Department
T. G. Chapman, BSc *Leeds*, PhD *S'ton*, FIEAust

Senior Lecturers
A. J. Bonham, BSc (Eng) *Lond.*, MEngSc *N.S.W.*, AKC, CEng, MICE, MIWE, MIEAust
B. W. Golley, BE *Adel.*, MSc (Eng) PhD *Qu.*, MIEAust, MASCE
J. Sneddon, BE *N.S.W.*, BSc (Tech) *N'cle (N.S.W.)*, PhD *N.S.W.*, MIEAust

Lecturers
M. N. Haque, BSc Eng *Panj.*, MEng *A.I.T. Bangkok*, PhD *N.S.W.*
Vacant (2 positions)

Tutor
Vacant

Teaching Fellow
J. S. Childs, BE *Syd.*

Professorial Engineer
M. Gopalan, BSc (Eng) *Kerala*, PhD *N.S.W.*

Department of Electrical Engineering

Professor of Electrical Engineering and Head of the Department
H. E. Green, ME *Adel.*, PhD *Ohio State*, CEng, FIEAust, FIREEAust., SMIEEE, jssc

Senior Lecturers
J. D. Cashman, BE *N.S.W.*, BA, MSc *A.N.U.*
G. Cochrane, BSc *Lond.*, PhD *N.E.*, MInstP, MIREEAust
C. G. J. Streatfield, BSc (Eng) *Lond.*, CEng, MIEE, MIEAust

Lecturers
M. C. Cavenor, BSc *Aston*, PhD *N.E.*
G. A. Moyle, ME *Auck.*, CEng, MIEAust, MIREEAust, MIEE, MIEEE

Teaching Fellow
J. F. Arnold, BE *Melb.*

Engineer
L. C. F. Whyte, BSc *A.N.U.*, MSc *Essex*

Department of Mechanical Engineering

Professor of Mechanical Engineering and Head of the Department
R. K. Duggins, BSc (Eng). *Lond.*, PhD *Nott.*, CEng., MIMechE., FIEAust.

Senior Lecturer
A. R. Watson, BE *Qld.*, MSC *Manc.*, CEng, MIMechE, MIEAust

Lecturers
I. W. Linnett, BE, MEng Sc *Syd.*
C. W. Thomas, ASTC (MechEng), MIEAust
N. E. Thompson, BSc *Syd.*, MSc *Birm.*
Vacant

Tutor
Vacant

Teaching Fellow
P. C. W. Frith, BE *Melb.*

Bridges Library

Librarian
Judith A. Wing, BA *Syd.*, ALAA

Acquisitions Librarian
Janet Perfrement, BA *Adel.*, DipLib *CCAE*

Cataloguing Librarian
Frances Rose, BA *Tas.*, ALAA

Reader Services Librarian
Jan Blank, BA *Qld.*, DipLib *CCAE*

Computer Centre

Manager
M. C. Smith, ME *N.S.W.*

Senior Analyst/Programmer
Willma Stibbards, BSc *Qld.*

Analyst/Programmers
R. S. Knock
A. J. Tonkin, BSc *Qld.*

The Royal Military College Calendar 1978

Principal Dates in 1978

January—

16 ..... Third Class return from leave
16 ..... First Class and NCOs from Second Class return from leave
17 ..... Remainder of 2nd Class and 4th Class Repeats return from leave
19 ..... New Entry marches in
23 ..... Military Training begins
25 ..... Executive of the Professorial Board meets

February—

1 ..... Academic Timetable Committee meets
3 ..... Dean's Advisory Committee meets
7 ..... Professorial Board meets
10 ..... Higher Degree Committee meets
10 ..... Executive of the Faculty of Military Studies meets
10 ..... Dean's Expenditure Committee meets
10-17 ..... First Class Visit to Combined Demonstrations
14 ..... Fourth Class applications for academic courses due
15 ..... Computer Committee meets
22-28 ..... AKABRI cadets visit RMC
22 ..... Executive of the Professorial Board meets
23 ..... Executive of the Interim Council meets
24 ..... Fourth Class enrolments in academic courses due
25 ..... Inter-Service Colleges Swimming Competition
26 ..... Commencement Church Service
27 ..... Academic year begins

March—

1 ..... Advance Party Armoured visit departs
3 ..... Dean's Advisory Committee meets
3 ..... Bridges Memorial Library Committee meets
3 ..... Dean's Expenditure Committee meets
4 ..... Inter-Company athletics
5-9 ..... First Class Armoured Visit
7 ..... Professorial Board meets
7-8 ..... DMA's Board of Studies for 2nd, 3rd and 4th Classes
8 ..... Arts Committee meets
9 ..... 1812 Overture
10 ..... Higher Degree Committee meets
10 ..... Faculty of Military Studies meets
13 ..... Canberra Day Public Holiday
15 ..... Engineering Committee meets
17 ..... Military Studies Examination Committee meets—Study Area 1
17 ..... Dean's Expenditure Committee meets
18 ..... ISCAM
20-21 ..... DMA's Board of Studies 1st Class
21 ..... Inter-company cross-country run
22 ..... Science Committee meets
23-28 ..... Easter Recreation Camp

23-29 ..... Easter Leave Period
29 ..... Executive of the Professorial Board meets
29-31 ..... 1/77 Schoolboys Visit
30 ..... Interim Council meets
31 ..... Last day for course changes

April—

4 ..... Professorial Board meets
5-7 ..... Headmasters'/Principals' Visit
7 ..... Dean's Advisory Committee meets
7 ..... Bridges Memorial Library Committee meets
7 ..... Dean's Expenditure Committee meets
10-14 ..... Artillery/Mortar Exercise at Holsworthy—1st Class
12-14 ..... 2/77 School Boys Visit
14 ..... Higher Degree Committee meets
14 ..... Executive of the Faculty of Military Studies meets
21 ..... Dean's Expenditure Committee meets
25 ..... Anzac Day
26 ..... Executive of the Professorial Board meets

May—

2 ..... Professorial Board meets
5 ..... Dean's Advisory Committee meets
5 ..... Bridges Memorial Library meets
5 ..... Dean's Expenditure Committee meets
9 ..... Assessed TEWT Study Area 2
12 ..... Higher Degree Committee meets
12 ..... Executive of the Faculty of Military Studies meets
13 ..... First term ends
14-20 ..... Fourth Class Visit Field Force units
15-20 ..... Field Exercise—Defensive Operations—1st Class
15-21 ..... UNSW Recess
19 ..... Dean's Expenditure Committee meets
21-26 ..... First Class leave period
23 ..... Military Studies Examinations Committee meets—Study Area 2
29 ..... Second term begins
31 ..... Executive of the Professorial Board meets
31 ..... Computer Committee meets

June—

1 ..... Executive of the Interim Council meets
2 ..... Dean's Expenditure Committee meets
2 ..... Bridges Memorial Library Committee meets
2 ..... Dean's Advisory Committee meets
6 ..... Professorial Board meets
7 ..... Arts Committee meets
7-9 ..... Headmasters'/Principals' Visit
9 ..... Higher Degree Committee meets
9 ..... Faculty of Military Studies meets
10 ..... Queen's Birthday Parade and Ball
12 ..... Queen's Birthday Holiday
14 ..... Engineering Committee meets
19-23 Jul ..... UNSW Mid Year Recess
21 ..... Science Committee meets
23 ..... Dean's Expenditure Committee meets
24 ..... Inter-Company Drill Competition
26-4 Jul ..... Mid-Year Study and Examinations
28 ..... Executive of the Professorial Board meets
29 ..... Interim Council meets

July—

4 ..... Professorial Board meets
7 ..... Dean's Advisory Committee meets
7 ..... Dean's Expenditure Committee meets
7 ..... Bridges Memorial Library Committee meets
9 ..... Mid-Year Church Parade
11 ..... Supplementary cross-country run
12-13 ..... DMA's Mid-Year Review-Arts
14 ..... Higher Degree Committee meets
14 ..... Executive of the Faculty of Military Studies meets
19-20 ..... DMA's Mid-Year Review—Engineering and Science
19-23 ..... UNSW Mid-Year Recess
21 ..... Dean's Expenditure Committee meets
25 ..... Assessed TEWT-Study Area 3
26 ..... Executive of the Professorial Board meets
28 ..... RMC Revue
30 ..... Five Way cross-country meeting

August—

1 ..... Last day for withdrawal from subjects for 4th Class
1 ..... Professorial Board meets
2-11 ..... Field Exercise—Offensive Operations at Holsworthy—1st Class
4 ..... Dean's Advisory Committee meets
4 ..... Dean's Expenditure Committee meets
4 ..... Bridges Memorial Library Committee meets
9 ..... Computer Committee meets
11 ..... Higher Degree Committee meets
11 ..... Faculty of Military Studies meets
12 ..... Second academic term ends
13-1 Sep ..... Leave and attachments
14 ..... CDFS Conference at RMC
14-1 Sep ..... Parachute Course at Wiliamstown
15-19 ..... CGS Exercise at RMC
20 ..... First Class return from leave
21 ..... Military Studies Examination Committee meets—Study Areas 3 and 5
23-24 ..... DMA's Board of Studies—1st Class and selected students
28-3 Sep ..... UNSW Recess
30 ..... Executive of the Professorial Board meets

September—

3 ..... Second, 3rd and 4th Classes return from leave

4 .....Third academic term begins
5 .....Professorial Board meets
6 .....Arts Committee meets
7 .....Executive of the Interim Council meets
7 .....Second Supplementary cross-country run
8 .....Dean's Expenditure Committee meets
8 .....Dean's Advisory Committee meets
8 .....Bridges Memorial Library Committee meets
13 .....Engineering Committee meets
15 .....Higher Degree Committee meets
15 .....Executive of the Faculty of Military Studies meets
18 .....Advance party for LWC departs
20 .....Science Committee meets
22-24 .....HAC Visit
22 .....Last day for applications for academic courses for 1979
22 .....Dean's Expenditure Committee meets
24-16 Oct .....LWC course at Canungra—1st Class
25 .....Military Studies Exams Committee meets—Study Area 4
27 .....Executive of the Professorial Board meets

October—

2 .....Labour Day Holiday
3 .....Professorial Board meets
5 .....Interim Council meets
6 .....Dean's Advisory Committee meets
6 .....Dean's Expenditure Committee meets
6 .....Bridges Memorial Library Committee meets
13 .....Higher Degree Committee meets
13 .....Executive of the Faculty of Military Studies meets
16 .....First Class returns from LWC
16-17 .....DMA's Board of Studies 2nd, 3rd and 4th Classes
20 .....Dean's Expenditure Committee meets
21 .....Battle Efficiency Competition
24 .....Lectures end
25 .....Study period begins
25 .....Computer Committee meets
25 .....Executive of the Professorial Board meets
27 .....CSC Committees for 1979 promulgated
30-11 Nov .....Academic examinations

November—

1-3 .....First Class Telephone Battle
3 .....Dean's Advisory Committee meets
3 .....Dean's Expenditure Committee meets
3 .....Bridges Memorial Library Committee meets
3 .....Military Studies Examination Committee meets—Study Area 6
6-7 .....DMA's Board of Studies 1st Class meets
7 .....Professorial Board meets
9 .....Military Examination and Appointments Committee meets
10 .....Higher Degree Committee meets
10 .....Faculty of Military Studies meets
11 .....Remembrance Day
11 .....Academic year ends
13-1 Dec .....Annual Field Training Exercise
17 .....Dean's Expenditure Committee meets
24 .....Examinations Committee meets
29 .....Executive of the Professorial Board meets

December—

1 .....CSC returns from Annual Field Training
1 .....Dean's Advisory Committee meets
1 .....Dean's Expenditure Committee meets
2 .....Field Training Exercise Administration
4 .....DMA's Board of Studies for selected students
5 .....Professorial Board meets
6 .....Commandant's Board of Studies meets
7 .....CSC Banner Parade
7 .....Presentation of prizes and sporting trophies
8 .....Last day for submission of changes for academic course applications
10 .....Church Parade
11 .....Presentation of military and academic prizes
12 .....Graduation Parade and Ball
14 .....Leave begins for CSC
18-31 .....Visit to AKABRI

RMC CALENDAR 1978

Term	Week	Month	Dates	4th Class	3rd Class	2nd Class	1st Class
1	0	Jan	15–21				
	1		22–28				
	2	Jan–Feb	29–4				
	3		5–11				
	4		12–18				Combined Tour
	5		19–25				
	6	Feb–Mar	26–4				Armd Visit
	7		5–11				
	8		12–18				
	9		19–25				
	10	Mar–Apr	26–1			Easter Leave 23–29 Mar	
	11		2–8				
	12		9–15				Arty Mor Ex
	13		16–22				
	14		23–29				
	15	Apr–May	30–6				
	16		7–13				Assessed TEWT
UNSW Recess	17		14–20	Visit FF Units	—	Leave/Studies	IMT Ex
2	18		21–27				Leave
	19	May–Jun	28–3				
	20		4–10				
	21		11–17				
UNSW	22		18–24				
Mid Year	23	Jun–Jul	25–1		Mid-Year Exams 26 June–4 Jul		
Recess	24		2–8				
	25		9–15				
	26		16–22				
2	27		23–29				Assessed TEWT
	28	Jul–Aug	30–5				IMT Ex
	29		6–12				
	30		13–19				Leave
	31		20–26		Leave/Studies		
UNSW Recess	32	Aug–Sep	27–2				
3	33		3–9				
	34		10–16				
	35		17–23				
	36		24–30				
	37	Oct	1–7				LWC Course
	38		8–14				
	39		15–21				
	40		22–28				
	41	Oct–Nov	29–4		Studies/Examinations		Tele Battle
	42		5–11				Fd Trg Prep
	43		12–18	Field Training			
	44		19–25				
	45	Nov–Dec	26–2				
	46		3–9	Preparation for Graduation			
	47		10–16	Graduation			

Academic Studies Military Studies

General Information

The Royal Military College Course

The Royal Military College course comprises both military and academic studies. The course is conceived as a whole; that is, a cadet must pass in both his military and academic studies to graduate from the College. He must also meet the standards required in the qualities of leadership.

The military curriculum is planned to achieve the best balance between the short-term requirements of a junior regimental officer and the broader foundation necessary for those who will progress to the higher ranks of the Army.

Each cadet enrols as an undergraduate student of the University of New South Wales in one of the courses in the Faculty of Military Studies, namely, Arts, Applied Science, and Civil, Electrical and Mechanical Engineering. Cadets are admitted to courses on the basis of their secondary school records, and as far as possible according to their preferences.

The duration of the pass courses in Arts and Applied Science is four years. The honours courses take five years. The Engineering courses all take five years. The first three years in each case are primarily academic years, and the fourth year consists entirely of military studies. The fifth year is devoted to academic studies.

A cadet is commissioned after completing the fourth year of his course. Final year honours students and final year engineering students are officer undergraduate students.

Degrees

The following degrees of the University of New South Wales are awarded to students in the Faculty of Military Studies who qualify in the prescribed courses:

Bachelor of Arts in Military Studies	(BA(Mil))
Bachelor of Arts with Honours	(BA)
Bachelor of Science in Military Studies	(BSc(Mil))
Bachelor of Science with Honours	(BSc)
Bachelor of Engineering	(BE)

Opportunities exist in the Faculty of postgraduate study and research leading to the University's degrees of Master of Arts (through research), Master of Science, Master of Engineering, Master of Engineering Science and Doctor of Philosophy.

Admission

Entry to the Royal Military College is by selection; a candidate must have reached an approved academic standard and must meet certain physical and personal standards. Admission to undergraduate courses in the Faculty of Military Studies is restricted to cadets of the Royal Military College who meet the matriculation requirements of the University and to other members of the regular Defence Forces who meet such requirements and who may be approved by Faculty.

Enrolment in miscellaneous subjects in the Faculty of Military Studies is usually restricted to cadets of the Royal Military College and members of the Regular Defence Forces who meet the matriculation requirements of the University. Because of the special circumstances of the Faculty, a member of staff employed in the Faculty of Military Studies may be permitted to enrol for miscellaneous subjects.

Postgraduate registration in the Faculty of Military Studies is not restricted to military students.

General Entry Qualifications

Any young man who is seeking a career as an officer in the Australian Regular Army and who meets the entry qualifications is eligible to apply for entry to the Royal Military College. The qualifications are that he must:

(a) be aged between $16\frac{1}{2}$ and $19\frac{1}{2}$ on the date he would enter the College;
(b) be an Australian citizen or otherwise meet certain conditions of citizenship;
(c) be unmarried;
(d) meet prescribed standards of medical fitness; and
(e) meet the education qualifications.

New Zealand applicants need corresponding qualifications to be eligible for selection, by the New Zealand Army, to enter the Royal Military College.

Royal Military College Scholarships

Up to 50 Royal Military College Scholarships are awarded annually to selected Australian secondary school students to assist them financially during the final school year (Year 12). Scholarship holders who complete the educational qualifications (and who continue to be medically fit) are assured of places at the College in the next intake.

The value of a Royal Military College Scholarship is currently $400.00.

Application for Entry

Australian candidates may obtain application forms for normal entry to the College or for RMC Scholarships from the Army Recruiting Officer, GPO Box XYZ, in the capital city of each state.

Advertisements for applicants appear in the papers in July each year. Applications usually close early in August.

New Zealand candidates may obtain application forms from any Armed Forces or Army Recruiting Office. Applications should be made during the year in which the bursary is taken. Selection Boards are held in May, September and December.

Educational Qualifications for Entry to the Royal Military College

To be qualified educationally for entry to the Royal Military College a candidate must:

(a) meet the matriculation requirements of the University of New South Wales, and
(b) meet the subject prerequisites for one of the degree courses in the Faculty of Military Studies.

Subject Prerequisites—A candidate must achieve appropriate levels of attainment in the Higher School Certificate courses shown in order to be eligible to enrol in the respective subjects of the BA(Mil), BSc(Mil) and BE courses in the Faculty of Military Studies:

	N.S.W Higher School Certificate Prerequisite	
Faculty subject	*Subject*	*Level of attainment*
BA(Mil) course		
*1405 History I	3 unit English or 2 unit English or 2 unit A English	1, 2, 3 or 4 1, 2 or 3 1 or 2
1507 English I	3 unit English or 2 unit English	1, 2 or 3 1, 2 or 3
1131 Mathematics IA 1132 Mathematics IB	4 unit Mathematics or 3 unit Mathematics or 2 unit Mathematics	1, 2, 3, 4 or 5 1, 2 or 3 1 or 2
BSc(Mil) course		
1521 English A		
*1131 Mathematics IA 1132 Mathematics IB	4 unit Mathematics or 3 unit Mathematics or 2 unit Mathematics	1, 2, 3, 4 or 5 1, 2 or 3 1 or 2
1203 Physics I 1306 Chemistry I	2 or 4 unit Science (including Physics or Chemistry)	1, 2 or 3
BE Course		
*1131 Mathematics IA *1132 Mathematics IB	4 unit Mathematics or 3 unit Mathematics or 2 unit Mathematics	1, 2, 3, 4 or 5 1, 2 or 3 1 or 2
*1273 Physics I	(i) 2, 3 or 4 unit Mathematics (ii) 2 or 4 unit Science (including Physics or Chemistry)	As for Mathematics, above 1, 2 or 3
*1303 Chemistry	2 or 4 unit Science (any strand)	1, 2 or 3
*1708 Engineering I	either 2 or 4 unit Science (including Physics) or 2 unit Industrial Art or 3 unit Industrial Art	1, 2 or 3 1, 2 or 3 1, 2, 3 or 4

Where * indicates subjects which are compulsory in the relevant degree courses.

Candidates from other States

In general, a candidate who completes his secondary education in a state other than New South Wales will meet the above requirements if he qualifies for admission to an appropriate faculty in a university in that state, although his admission to the Faculty of Military Studies will be subject to the approval of the Professorial Board.

New Zealand Candidates

The minimum standard is a 'B' Bursary pass including at least a sixty per cent pass in Mathematics for a science or engineering degree.

The Bridges Memorial Library

The library was established in 1911 when the Royal Military College was founded and is named after the first Commandant of the College. The library occupied various locations in the College before it moved to its present position in the Administration Building in

1960. In 1968 an extension was added at the southern end of the building and in 1971 a former classroom above this extension was taken over to house the current periodical collection. Finally in May, 1976, a tender for a further extension to the library was accepted at a cost of $602,000. Work is progressing and should be completed in June, 1978. When completed three will be a two-storey wing projected at the southern end towards Lavarack Road. The main library entrance, Reader Services and Technical Services will be situated on the top floor. The collections, reading room and audio visual room will be located on the lower floor.

Most books and periodicals are on open access, and the library now houses approximately 115,000 volumes of monographs and bound periodicals. There are also some 2,525 current serial titles.
Provision is made for inter library loan giving access to the resources of Australian and overseas libraries. A copying service is available and there are microfiche and microfilm reader/printer facilities.

Guides to the use of the library and of the catalogues are available at the circulation desk where copies of the library rules and conditions of loan are also available.

As most students find, in the course of their studies, that they will spend a considerable amount of time in the library, it is important that they understand how the library works. In order that they can use facilities to the best advantage new students are introduced to library resources during Orientation Week. The Reader Adviser's Unit provides a general introduction, guided tours and printed guides. During first and second terms tutorials are provided for all classes on the use of bibliographical aids and on specific subjects relating to essay topics set during the year.

All books in the library may be referred to by students and most may be borrowed, provided that library rules are observed. A student may also use his own books in the library. For further information on the library and its resources students should consult the Reader Adviser's Unit.

Persons who are not members of the Royal Military College and research students from other universities, who seek access to the library, are welcome to use its resources, but should make written application to the Librarian.

The library is open during the following hours in term time:
Monday to Friday 8.00 a.m. to 5.20 p.m.
Monday to Thursday 7.00 p.m. to 10.00 p.m.
Sunday 2.00 p.m. to 5.00 p.m. and 7.00 p.m. to 10.00 p.m.

During vacations the hours of opening are 8.00 a.m. to 5.20 p.m. Monday to Friday.

The Computer Centre

The Computer Centre provides computer processing services for teaching, research and administration throughout the College and, in addition, provides a program and data punching service. These facilities are available for use by all students and staff of the College. The Centre also gives support to courses in computing conducted by local high schools.

The first computer in the College, a Honeywell DDP516, was installed in the late 1960s and carried the major load until mid 1976 when a Digital Equipment PDP11/45 was brought into operation. These two computers are now linked together with the PDP11/45 carrying out all processing and the DDP516 acting as peripheral controller for line printer, card reader, graph plotter and disk drives. Current configuration includes 240K bytes core storage, four 7M byte drives and four industry standard magnetic tape drives (three 9 track and one 7 track) with further enhancements on order. This system supports a terminal network which is currently being expanded. In addition a terminal has been installed to remotely access the CSIRO Computer Centre in Canberra and the Honeywell Mark III time sharing service via satellite to Cleveland, Ohio, USA.

Further developments in the Computer Centre are currently being planned and it is envisaged that a medium scale computer supporting concurrent batch and time sharing will be installed shortly which, as well as being more powerful, will have a much wider range of programming languages and applications software available.

Academic Textbook Library

Textbooks prescribed for academic subjects are available on loan from the Academic Textbook Library. A cadet is expected to obtain the textbooks for all the subjects in which he is enrolled.

Books are issued at times to be notified at the beginning of the academic year, and are required to be returned to the textbook library after the annual examinations in November.

The textbook library is open regularly on Wednesdays between 1.00 p.m. and 4.00 p.m. Arrangements may be made with the Faculty Services Officer for the textbook library to be opened specially at other times.

Student Counsellor

The Student Counsellor provides an individual counselling service to cadets in the areas of academic, personal and motivational problems. In particular he is available:

(a) to assist Fourth Class cadets in the transition from secondary school environment to a tertiary level;
(b) to assist Fourth Class cadets in the transition from civilian to military life;
(c) to advise all cadets on study techniques and on individual problems of approach to academic work;

(d) in conjunction with the military staff, to assist in personal problems of cadets where these problems are affecting progress;
(e) in conjunction with the academic staff, to advise cadets in courses and subjects in relation to their own abilities and vocational goals.

In addition to the above functions the Student Counsellor participates in the selection of cadets for the College and undertakes research into student performance and related subjects.

(See Information for Students)

The Military Organisation and Studies

Military Organisation

The Military Staff

The principal elements of the military staff of the College are:

The Commandant: The Commandant has the overall military responsibility for the College; all military staff and the Corps of Staff Cadets are under his command.

The Director of Military Art: The Director of Military Art is the Deputy Commandant. The Commanding Officer, Corps of Staff Cadets and the Chief Instructor Military Training Wing report to the Director of Military Art. The Staff Officer Grade II Co-ordination and the Staff Officer Grade II Projects and their staffs work for the DMA.

The Corps of Staff Cadets: The staff in this group consists of the Commanding Officer, Corps of Staff Cadets; Company Commanders, the RSM and other officers and non-commissioned officers who are responsible for the command and administration of the Corps. Some of these officers are also Military Instructors.

The Military Training Wing: The staff in this group consists of the Chief Instructor, subject instructors and supporting staff. This group is responsible for the conduct of military studies at the College. The Corps of Staff Cadets staff assists the Military Training Wing with the provision of instructors in some subjects.

The Administrative Staff: The staff in this group includes the Staff Officer Grade 1 (Administration) and the personnel and logistics staff of the College. This group provides support for the military staff and administrative support for the College as a whole. For administration which specifically affects the Corps of Staff Cadets and the Military Training Wing, the Staff Officer Grade 1 (Administration) reports to the Director of Military Art and for all other matters direct to the Commandant.

The Corps of Staff Cadets

The Corps of Staff Cadets is the organisation which provides the environment for the development of officer qualities in cadets and is responsible for some military instruction.

The Corps of Staff Cadets is organised on a battalion basis, consisting of a Battalion Headquarters and a number of companies, each company comprising cadets of all classes. In addition to the regular army staff referred to above, the senior cadet appointments within the battalion are filled by members of the graduating class (First Class) who are largely responsible for the detailed day-to-day running of the Corps. Battalion Headquarters is staffed by a Battalion Sergeant-Major, a Battalion Quartermaster Sergeant, a President of the Mess Committee, a Sports Co-ordinator and a number of cadets of Second Class who assist and understudy these appointments. Battalion Headquarters is responsible for the administration and discipline of the Corps as well as the co-ordination and administration of all sporting and social activities in which the Corps is involved.

Each Company consists of a Company Headquarters and a number of platoons. Company Headquarters is staffed by a Company Sergeant-Major, Company Quartermaster Sergeant (both cadets of First Class) and two cadets of Second Class who assist and understudy these cadets. This Headquarters is responsible for the administration and discipline of the company.

A cadet of First Class commands each platoon, each of which has three sections, and is responsible to the Company Sergeant-Major for its efficiency. The section is the basic unit within the Corps. It is commanded by a cadet of First Class and contains cadets from each of the other three classes.

Military Training Wing

The Military Training Wing is responsible for the planning, co-ordination and implementation of the military studies curriculum.

To meet the requirements of the military studies curriculum the Military Training Wing is organised into four separate but inter-related teams:

Headquarters and Training Support Team: Under the command of the Chief Instructor, the staff in this team are responsible for the command, control and co-ordination of military instruction. The Team includes a training development section, a co-ordination and clerical section and a training aids section.

Tactics Team: Under the control of the Senior Instructor Tactics, this team is responsible for instruction in Tactics and in the allied subjects of Armour, Artillery, Military Engineering, Signals, Aviation and Infantry.

Field Training Team: Under the control of the Senior Instructor Field Training, this team is responsible for instruction and practical training in infantry weapons and infantry minor tactics.

General Studies Team: Under the control of the Senior Instructor General Studies, this team is responsible for instruction in subjects of the Military Administration group. The team also provides instruction in individual subjects in the areas of Training and Officer Development.

Military Training Wing also co-ordinates the Officer Development Module. Instruction in this module is the responsibility of a joint team formed from the four major staff groups in the College.

The Military Studies Program

Introduction

The Royal Military College course comprises both military and academic studies. In order to graduate, a cadet must pass in both his military studies which are prescribed in the degree rules, and his academic studies. He must also demonstrate that he possesses the qualities required of an officer, particularly the capabilities of leadership. The military studies curriculum is designed to educate cadets to meet these requirements, as well as develop the cadets' officer qualities. The military curriculum reflects the need for assessment in this process.

During the first three years of the course, military studies are scheduled in conjunction with academic studies. The fourth year is devoted entirely to military studies.

Engineering students and honours students in arts and science remain at the College after commissioning to complete their academic studies.

Junior Class Curricula

The military studies during the first three years of the College program are scheduled in conjunction with academic studies. Each class has a concentrated period of full-time military study of five weeks at the beginning of each year and three weeks at the end of each year. Some military work is programmed during each week of the academic terms.

The military studies program for the first three years embraces recruit training, infantry initial employment training and section commander training. In addition, cadets are instructed in subjects to promote their officer development.

A Fourth Class cadet (a cadet in his first year at the College) is oriented to the College requirements and begins his recruit training. By the end of this year as a cadet in Third Class, he will have achieved 'trained soldier standard' and completed infantry initial employment training. As a cadet in Second Class he will be trained to the standard of an infantry section commander and provided with basic instruction in preparation for his year of full-time military studies. Instruction is scheduled to achieve these levels as indicated below.

Class	*Level of Training*	*By Training Week*	*Content*
4	Orientation	5	Introduction to service life. Administrative requirements completed.
4	Recruit	42	Army recruit training completed.
3	Trained soldier	45	Infantry initial employment training completed.
2	Infantry section commander	5	Infantry section commander course and special RMC requirements at this level completed.
2	First Class pre-entry	45	Introduction to First Class and practice in section commander's role

First Class Curriculum

The First Class Curriculum completes the military instruction at the College and prepares cadets for their first appointment as Lieutenants in the Australian or other armies. To commence the First Class program, a

cadet must have satisfactorily completed the first three years of military and academic studies. The First Class program is divided into six study areas. A cadet should have satisfactorily completed each study area before progressing to the next. The six study areas are:

Study area one
Orientation. This is an introductory study area. Its scope includes testing and revision of previous military instruction, evaluation of cadet's oral and written communication skills, and orientation to instructional methods and techniques. The study area includes an introduction to tactics and the principles of war. Visits and training undertaken at other military establishments contribute to this study area.

The topics scheduled for strategic studies are aimed at providing students with a background of relevant strategic and national considerations affecting Australia.

Study area two
Tactics and Operations One—Defensive Operations. This is the first of three study areas which comprise the tactics and operations series in the program. This study area covers the defence and withdrawal phases of war; the employment of supporting arms and services, the logistic considerations applicable to defensive operations; operational planning and command and control techniques. The study area includes exercises and presentations on past military campaigns and exercises in relevant staff duties Instruction is conducted indoors and outdoors; by tutorial exercises, practical field exercises; and at other military training establishments.

Study area three
Tactics and Operations Two—Offensive Operations. This study area follows Defensive Operations and covers the advance and attack phases of war. It deals with the employment of supporting arms and services; logistic considerations; operational planning; and command and control techniques relevant to Offensive Operations. Exercises and presentations are conducted on Offensive Operations in past military campaigns. Instruction is conducted in a similar manner to Study Area Two.

Study area four
Tactics and Operations Three—Special Operations. This completes the Tactics and Operations series and is programmed after Offensive Operations. Studies in this area consist of low intensity operations which include counter insurgency warfare, aid to the civil power and United Nations peacekeeping operations. General aspects of nuclear, biological and chemical warfare are studied; and the special tactical and logistic problems arising from tropical and desert warfare are also covered. The study area also includes the employment of supporting arms and services; logistics, health aspects and legal considerations involved in special operations; and planning and command techniques applicable to low intensity operations. Cadets are also required to participate in presentations on previous military campaigns and undergo a training course at the Land Warfare Centre, Canungra.

Study area five
Military Administration. This area covers the study of logistics, administration in peace and war, military law, army health, training and staff duties. It includes tutorial and practical administrative exercises set at junior regimental officer level. Study Area Five is programmed in appropriate subject blocks throughout the year.

Study area six
Officer Development and Skills. This study area covers two groups of subjects. The first, Officer Development, consists of the personal values aspect of officer development, communication skills, leadership and service etiquette. These subjects are consolidated by a comprehensive series of group exercises and discussion. Current Affairs is also a subject contributing to Officer Development.

The second group of individual skill subjects covers drill and ceremonial, physical and recreational training, methods of instruction, topography and weapon training.

Subjects in this study area are programmed throughout the year.

Course Design

The First Class program has been designed to meet the military art, scientific and technological requirements of the Degree rules. Study Areas One to Four are scheduled in numerical order and form the basis of the program. Study Area Five is scheduled as modules between the four basic study areas and Study Area Six subjects are scheduled on an individual basis throughout the year. Provision for regular testing, assessment and revision is included in the course.

Allotment of Military Periods

The instruction time allotted to military subjects is shown below. The table does not include time spent in Corps of Staff Cadet activities such as ceremonial parades, inter-company competitions, sport and leave; nor does it include visits, administration, study and field training activities.

Subject	*Class*			
	4	*3*	*2*	*1*
Tactics and Operations				
Armour				49
Artillery				43
Infantry	35	80	72	5
Intelligence				13
Military Engineering				23
Military History				54
Signals		32	22	10
Strategic Studies				23
Tactics	5			363
Topography	1	38	23	10
Weapon Training	67	88	58	63
Military Administration				
Army Health	23	1		15
Logistics				15
Military Law	3			32
Peace Administration				53
Staff Duties		3		119
Training				28

Officer Development and Skills				
Personal Values	3	4	3	4
Communications Skills	2	6	3	8
Current Affairs	7	8	4	
Drill and Ceremonial	60	24	29	70
Leadership	1		12	6
Methods of Instruction		15	16	17
Physical and Recreational Training	124	105	94	115
Service Etiquette	4			9

Military Subjects

Individual subjects in the military requirement for the degree may be classed in three groups.

Tactics and Operations

Armour. The syllabus covers the organisation, roles, tasks and characteristics of armoured units employed in a Task Force operational situation; direction of armoured fighting vehicle firepower; a combined infantry/armour practical field exercise and the employment of armour in operations. It is a major component of Study Areas Two, Three and Four.

Artillery. Topics covered are the organisation, roles, tasks and characteristics of artillery units employed in a Task Force operational situation; the theory and practice of fire control; and the employment of artillery in operations. It is a major component of Study Areas Two, Three and Four.

Infantry. This subject deals with the theory and practice of operational techniques at platoon and company level. It also examines, in detail, the employment of infantry in operations. It is a major component in Study Areas Two, Three and Four. Exercises in platoon and company operational techniques are used to develop the officer qualities of command and leadership. These exercises are conducted for all classes.

Intelligence. Topics covered are the organisation and roles of intelligence units and headquarters staff within the division; the intelligence process within the unit and unit security. It is taught during Study Areas Two and Three.

Military Engineering. This subject covers the organisation, roles, tasks and characteristics of engineer units within the division. It deals with the employment of engineers in support of infantry operations and also includes instruction in basic field defences. It is taught during Fourth Class and in Study Areas Two, Three and Four of First Class.

Military History. This subject has been included to complement instruction in Tactics and provide a military educational base for officer development and postgraduate military studies. The program is developed around case studies of past military campaigns.

Signals. Instruction covers the theory and practice of radio-telephone procedure and operation of communication equipments at unit level. It also covers the organisation, roles, tasks and characteristics of Signals units in the division and examines the employment of these units and communication electronic equipment in various operations. It is taught during Third and Second Class and in Study Areas Two, Three and Four of First Class.

Strategic Studies. This subject develops from the subject of Current Affairs. It provides an understanding of the military, political and geographical significances of selected areas that could affect the defence of Australia.

Tactics. This subject provides graduates with the knowledge required to plan and conduct operations to infantry company level. Instruction is based on infantry operations with supporting arms and services and will cover all phases of war and other operations. It includes practical field exercises and is taught during Study Areas One, Two, Three and Four.

Topography. This subject covers the theoretical and practical aspects of navigation over varying terrain by day and night. It includes map reading, air photo reading and the topographical aspects of operational planning. Instruction is programmed throughout the four years of the course.

Weapon Training. This subject covers the handling, firing and employment of the weapons of a rifle company; it covers the characteristics and employment of the weapons of the infantry support company and trains the graduate to plan and conduct range practices for selected infantry weapons. Instruction is programmed throughout the four years of the course.

Military Administration

Army Health. Instruction in this subject provides cadets in Fourth Class with the knowledge and skills of first aid. Instruction to First Class provides a knowledge of health services in the army and enables them to supervise health measures at unit level.

Logistics. Studies in this subject cover the maintenance and resupply system which supports unit operations in a divisional environment. It is taught in conjunction with the Tactics series and is also programmed in Study Area Five.

Military Law. This subject provides the graduate with the knowledge required to apply Military Law as a junior officer. It also includes an introduction to the law of war, particularly the Geneva Convention. It is programmed in Study Area Five.

Peace Administration. Instruction in this subject covers administration of personnel, procedures for unit stores management and unit financial accounting. It is a major component in Study Area Five.

Staff Duties. This subject introduces operational and non-operational staff skills and techniques required to deal with staff matters in a unit. It is a major component of Study Area Five.

Training. Instruction covers the design and conduct of training activities at sub-unit level. It is complemented by the subject Methods of Instruction. Training is programmed as part of Study Area Five.

Officer Development and Skills

Personal Values. This subject provides a foundation

for character development as part of the overall program of developing officer qualities. It includes discussions on human relationships, attitudes towards issues which are important to military life and the practical application of basic religious principles. It is programmed throughout the four years of the course.

Communication Skills. This subject develops the oral and written communication skills required of a junior regimental officer. It is programmed during the last three years of the course.

Current Affairs. This subject assists the cadet to understand the significance of events in Australia's areas of interest and encourages the cadet to discuss these events in both formal and informal groups. It is programmed throughout the first three years of the course.

Drill and Ceremonial. Instruction in this subject enables the cadet to participate in College parades and to perform those drill and ceremonial duties required of a regimental officer. The subject promotes a sense of discipline and *esprit de corps* and is programmed throughout the four years of the course.

Leadership Theory. This subject provides instruction in the theories and practice of leadership, and guidance is provided with problems that a graduate may encounter in leading men, both within the Corps of Staff Cadets environment, and during commissioned service. Instruction is designed to complement other studies, which are conducted to promote officer development. In addition to the formal training received in the area of officer development, a cadet must practically demonstrate that he has the personal characteristics required of a leader in order to be commissioned.

Methods of Instruction. This subject deals with the knowledge and techniques necessary to organise, supervise and conduct instruction. It complements the subject of Training and is taught in the last three years of the course.

Physical and Recreational Training. This subject is designed to develop and maintain a high standard of 'all round' physical fitness. Training is oriented towards the development of physical skills required by a graduate. In addition, instruction will be given on the organisation of sports meetings and on coaching. Instruction is programmed through the four years of the course.

Service Etiquette. This subject is designed to develop an appreciation of the manner and etiquette which facilitate ease and pleasantness in any company, and to familiarise cadets with mess customs and procedures. The syllabus is designed to make cadets aware of their social responsibilities both within and outside the service.

The Faculty of Military Studies

of the

University of New South Wales

Faculty Information

Organisation and Functions

In 1967, the University of New South Wales and the Department of the Army agreed to co-operate in developing the Royal Military College into a separate autonomous degree-conferring body within a period of ten years.* To this end, the University established the Faculty of Military Studies at the College.

The Faculty of Military Studies is one of the 10 faculties constituted by the Council of the University in accordance with Chapter IV of the By-laws made under the University of New South Wales Act, 1968. (The Act and By-laws are quoted in Section A of the University Calendar.) It exercises its powers and performs its duties under the authority of the Professorial Board of the University. It is particularly charged with the responsibility of advising the Interim Council of the Royal Military College, the Professorial Board and the Council of the University on the development of courses suitable to the needs of the College and leading to the granting by the University of the degrees of BA (Mil), BSc (Mil), BA, BSc and BE in the Faculty.

The Faculty of Military Studies consists of the Dean, the Commandant, the professors, associate professors, senior lecturers and lecturers appointed by the University, the Director of Military Art, the Director of Army Training, certain of the Heads of Schools at the University whose disciplines are relevant, the Registrar of the University, the Faculty Secretary, such other persons with appropriate qualifications as the Council may appoint (these include the Commanding Officer of the Corps of Staff Cadets, the Chief Instructor of the Military Training Wing, the Company Commanders and the Student Counsellor) and four students elected by the students enrolled in the Faculty. The Dean is appointed by Council. The Chairman is elected by the Faculty from among its professors for a two-year period.

The Faculty supervises teaching and examining in the subjects for which it is responsible, and it is concerned with encouraging scholarship and research. It deals with business raised by departments and by individual members, and it also reports on matters referred to it by the Professorial Board, the Vice-Chancellor, the Council and the Interim Council of the College. Its decisions, reached by simple majority voting, are transmitted in the form of resolutions to the Professorial Board (and, where appropriate, to the Interim Council).

The Faculty of Military Studies usually meets four times each year. Further meetings may be called by the Registrar of the University, after consulting the Dean and Chairman. Agenda papers are distributed before each meeting and minutes after it; copies go to every Faculty member. The quorum for a meeting is one-third of the members, excluding those members granted leave of absence by the Vice-Chancellor; it is important, therefore, for members to seek leave if they are unable to attend a meeting.
To expedite its business, Faculty may appoint *ad hoc* sub-committees. There are also several standing committees of Faculty charged with particular functions.

The Executive Committee comprises the Chairman of Faculty, the Dean, the Associate Registrar of the University, Heads of Departments in the Faculty and Chairmen of the Degree Committees of Faculty, all *ex officio*, the Pro-Vice-Chancellor, the Commandant, the Director of Military Art, three Heads of Schools at

* The affiliation of the College with the University has been extended under a new agreement between the Minister for Defence and the University.

Kensington, professors in the Faculty who are not heads of departments, the Faculty Secretary, all appointed by Faculty, and three members elected by Faculty for a two-year term. It usually meets six times each year to consider all Faculty business and to make recommendations on the agenda to the meetings of Faculty. It has authority to transmit decisions on urgent matters directly to the Professorial Board subject to their being reported to the next meeting of Faculty. The agenda for Executive Committee meetings is sent in advance to all members of the Faculty, and any member who wishes may attend a meeting, although he cannot vote. Executive Committee minutes are sent to all members of Faculty also.

The Higher Degree Committee consists of the Chairman of Faculty, the Dean, all professors who are members of Faculty, the Registrar of the University *ex officio*, and six members nominated by Faculty. It meets several times a year, and attends to matters relating to higher degrees in accordance with the policies agreed by the Professorial Board. When questions of policy arise, the Higher Degree Committee makes its recommendations to Faculty.

The Examinations Committee consists of the Chairman of Faculty, the Dean, all the academic teaching members of Faculty, the Director of Military Art, the Registrar of the University and the Faculty Secretary. The Committee reviews the annual examination results of all undergraduate students in the Faculty. It transmits its decisions to the University for entry into the students' records, and makes relevant recommendations to the Commandant.

The Faculty of Military Studies has set up three Degree Committees (the Arts Committee, the Science Committee and the Engineering Committee) to enable members to give greater and more concentrated consideration to the courses in which they are primarily concerned. The Degree Committees each meet three times or more during the year, and they report to Faculty through the Executive Committee.

Membership of the Faculty of Military Studies

Dean
Professor J. C. Burns, MSc *N.Z.*, BA *Camb.*, PhD *Manc.*

Chairman
Professor H. E. Green, ME *Adel.*, PhD *Ohio State*, CEng, FIEAust., FIREEAust., SMIEEE, jssc

Faculty Secretary
Mr R. W. O. Pugh, BE *Syd.*, BA *A.N.U.*, psc

The professors, associate professors, senior lecturers and lecturers of the Faculty at Duntroon, the following members of the College:
Major-General A. L. Morrison, DSO, MBE, rcds, psc
Colonel A. Clunies-Ross, MBE, jssc, psc, psc (US)
Lieutenant-Colonel R. J. Moyle, jssc, psc, RAAC
Major A. Harkness, BA *A.N.U.*, psc, pl, RAA
Major P. R. Florance, Dip Mil Stud, RACT
Major K. G. Gallagher, RA Inf
Major P. E. Green, RA Inf
Major D. J. Halmarick, RAAOC
Major R. V. McEvoy, RAA
Major R. J. McKinnon, B Tech (C Eng) *Adel.*, Grad IE Aust, qtc, RAE
Major K. A. Niquet, RA Sigs
Judith A. Wing, BA *Syd*, ALAA
Lieutenant-Colonel R. G. Curtis, MC
Lieutenant-Colonel H. F. Buckham, BCom, Dip. Psych *Qld*, MAPsS, AA Psych Corps
four student members elected by the students in the Faculty, Colonel R. S. Flint, psc Director of Army Training
and the following members of the University of New South Wales at Kensington:
Professor M. W. Allen, BE, *Adel.*, PhD *Syd.*, CEng, FIREE, MIEE, MIEEE
Head, School of Electrical Engineering
Professor R. A. A. Bryant, ME *N.S.W.*, ASTC, CEng, FIMechE, FIEAust, AFRAeS
Head, School of Mechanical and Industrial Engineering
Professor V. T. Buchwald, BSc., PhD *Lond.*, FIMA
Head, School of Mathematics
Professor F. K. Crowley, MA PhD *Melb.*, DPhil *Oxon.*, FAHA
Head, School of History
Professor E. P. George, BSc PhD *Lond.*, DSc *N.S.W.*, FInstP, FAIP
Head, School of Physics
Professor I. K. Lee, BCE, MEng Sc., PhD *Melb.*, FIEAust., MASCE, MAIMM
Head, School of Civil Engineering
Professor J. A. Mabbutt, MA *Cantab*
Head, School of Geography
Professor D. M. McCallum, BA *Syd.*, MA BPhil *Oxon.*
Head, School of Political Science
Professor H. Muir, BMetE *Melb.*, ScD *M.I.T.*, FIM, MAustIMM
Head, School of Metallurgy
Professor J. R. Niland, M Com. *N.S.W.*, PhD *Ill.*
Head, School of Economics
Professor H. J. Oliver, MA *Syd.*, FAHA
Head, School of English
Professor J. S. Shannon, DIC, PhD *Lond.*, DSc *Adel.*, FRACI
Head, School of Chemistry
Professor A. H. Willis, DSc (Eng.) *Lond.*, CEng, FIMechE, FIEAust, MemASAE, WhSc
Pro-Vice-Chancellor
Mr K. L. Jennings, BA MEd *Syd.*
Registrar of the University
Mr J. M. Gannon, ASTC, ARACI
Associate Registrar of the University

Undergraduate Courses

Arts

Undergraduate courses are offered in Economics, English, Geography, Government, History and Mathe-

matics. The courses in arts lead to the degree of Bachelor of Arts in Military Studies (BA(Mil)) at the pass level and the degree of Bachelor of Arts (BA) at the honours level.

A candidate for the pass degree must complete nine qualifying courses selected in accordance with the rules, and must complete a prescribed program of military studies. A pass student of merit may be permitted to transfer to an honours program in his second year in departments which offer honours courses. He will complete the military studies in the fourth year and his honours program in the fifth.

Applied Science

The applied science course comprises Chemistry, Geography, Mathematics and Physics, and includes general studies courses in Economics, English, Geography and History. Students must also complete a prescribed program of military studies. The course leads to the degree of Bachelor of Science in Military Studies (BSc(Mil)) at the pass level and the degree of Bachelor of Science (BSc) at the honours level.

The first year is common for all students, the second allows some choice of topics within the disciplines, and in the third year each student majors in one of the disciplines and takes either one or both of the others as minor subjects. A pass student of merit may be admitted to honours candidature; he will complete the military studies in the fourth year and his honours program in the fifth.

Engineering

Three courses are offered: civil engineering, electrical engineering and mechanical engineering. Electrical engineering provides for specialisation in either communications or power. The courses lead to the degree of Bachelor of Engineering (BE), which may be awarded as a pass degree or as an honours degree. Each of these three courses has been granted full recognition by the Institution of Engineers Australia and in addition the electrical engineering course has been recognised by the Institution of Radio and Electronics Engineers, Australia, and by the Institute of Electrical and Electronics Engineers.

The program of engineering subjects, Mathematics, Physics and Chemistry is prescribed for each course. There is also a component of general studies with courses in Economics, English, Geography and History. Students must also complete a prescribed program of military studies.

Engineering students are allotted to their courses on admission to the Faculty and generally are expected to remain in those courses. The first year program is common, however, and changes from one branch of engineering to another may be possible at the end of the first year.

The duration of the course is five years; the fourth year consists of military studies only.

Rules governing the award of the degrees

Bachelor of Arts in Military Studies

These rules apply to all students enrolling as first year students in 1977 and subsequent years.

An amendment to any rule which relates to courses of study that may be taken by candidates shall not apply to a candidate who, before the amendment takes effect, has completed one or more approved courses unless:

(a) the candidate elects that the amendment shall apply to him, and adopts a revised and approved course of study; or

(b) the Faculty determines otherwise.

1. The degree of Bachelor of Arts in Military Studies shall be conferred as a pass degree.

2. No person shall be permitted to enrol in any qualifying course for the degree of Bachelor of Arts in Military Studies at the same time as he is enrolled for any other degree or diploma in this University or elsewhere.

3. Where, in the following Rules, reference is made to the requirement that a candidate shall complete a course, the requirement shall be construed as meaning that the candidate shall:

(a) attend such lectures, seminars and tutorials as may be prescribed in that course; and

(b) perform satisfactorily in such exercises, laboratory work, essays, thesis and examinations as may be prescribed in that course.

4. A candidate may not enrol in a Course II of a subject until he has completed the appropriate Course I of that subject; and a candidate may not enrol in a Course III of a subject until he has completed the appropriate Course II of that subject.

5. A candidate for the degree of Bachelor of Arts in Military Studies shall be required to complete both the academic requirements of the degree, as specified in Rule 7, and the military requirements of the degree, as specified in Rule 8.

6. The academic requirements specified in Rule 7 shall be completed over the first three years of the candidate's course and the military requirements specified in Rule 8 shall be completed over all four years of the candidate's course. In special circumstances, an extension of time of one year may be granted to the candidate in which to complete either or both of the academic and military requirements.

7. **Academic Requirements.** A candidate shall complete nine qualifying courses which shall include:

(a) courses in at least three of the subjects –

Economics	History
English	Mathematics A
Geography	Mathematics B
Government	

(b) at least one major,

(c) either two sub-majors or a second major,

(d) eight courses in all from Schedule A1,

(e) electives from Schedule A2 to the value of one course,

where a major is a sequence of a Course I, a Course II and a Course III of one subject and a sub-major is a sequence of a Course I and a Course II of one subject, the choice of courses within or supplementary to a major or sub-major being subject to approval by the Head of Department concerned, *provided that* every student shall complete the course History I and a History II course as a sub-major or as part of a major.

8. **Military Requirements.** A candidate shall complete the program of training in the military requirements as set out in Schedule M.

9. Upon sufficient cause being shown, Faculty may, in particular cases, vary the requirements of Rules 3, 4 and 7, provided that any proposed variation shall be initiated by a recommendation from a Head of Department concerned.

SCHEDULE A1

Subject	*Course*	
Economics	1610	Economics I
	2612	Economics IIA
	2613	Economics IIB
	3612	Economics IIIA
	3613	Economics IIIB
	3614	Economics IIIC
English	1507	English I
	2507	English II
	3507	English III
	1508	Australian Literature
Geography	1954	Geography I
	2954	Geography II
	3954	Geography IIIA
	3955	Geography IIIB
Government	1001	Government I
	2001	Government II
	3021	Government III
History	1405	History I
	2407	History IIA
	2409	History IIB
	3408	History IIIA
	3410	History IIIB
Mathematics A	1131	Mathematics IA
	2131	Mathematics IIA
	3131	Mathematics IIIA
Mathematics B	1132	Mathematics IB
	2132	Mathematics IIB
	3132	Mathematics IIIB

SCHEDULE A2

Chemistry	1306	Chemistry I
Physics	1203	Physics I
Science	1807	Chemistry and Society
	1808	Engineering and Society
	1809	Mathematics for Social Scientists
	1810	Physics for Arts Students

For science half-units in Schedule A2 refer p. 62. The Chemistry and Physics units are to be found on pp. 69 and 73 respectively.

Bachelor of Arts with Honours in the Faculty of Military Studies

These rules apply to all students who enrol as first year students in 1973 or in subsequent years.

An amendment to any rule which relates to courses of study that may be taken by candidates shall not apply to a candidate who, before the amendment takes effect, has completed one or more approved courses unless:

(a) the candidate elects that the amendment shall apply to him and adopts a revised and approved course of study; or

(b) the Faculty determines otherwise.

1. The degree of Bachelor of Arts with Honours in the Faculty of Military Studies shall be conferred in the following categories:
   Honours Class I
   Honours Class II Division 1
   Honours Class II Division 2

2. No person shall be permitted to enrol in any qualifying course for the degree of Bachelor of Arts with Honours in the Faculty of Military Studies at the same time as he is enrolled for any other degree or diploma in this University or elsewhere.

3. A person on whom the pass degree of Bachelor of Arts or Bachelor of Arts in Military Studies has been conferred shall not be admitted to candidature for the degree of Bachelor of Arts with Honours in the Faculty of Military Studies

4. Where, in the following rules, reference is made to the requirement that a candidate shall complete a course, the requirement shall be construed as meaning that the candidate shall:
(a) attend such lectures, seminars and tutorials as may be prescribed in that course; and
(b) perform satisfactorily in such exercises, laboratory work, essays, thesis and examinations as may be prescribed in that course.

5. A recognised candidate for honours shall complete 10 qualifying academic courses and the military requirements in Schedule M in five years as specified in Rule 9. In special circumstances an extension of time of one year may be granted to a candidate in which to complete the requirements for the degree.

6. A candidate may not enrol in a Course II of a subject until he has completed the appropriate Course I of that subject; and a candidate may not enrol in a Course III of a subject until he has completed the appropriate Course II of that subject.

7. A student seeking recognition as a candidate for this degree shall choose either one or, with the approval of the relevant Heads of Departments, two subjects from the following as his subjects of special study:

Economics	Government
English	History
Geography	Mathematics

8. A student who has enrolled for the degree of Bachelor of Arts in Military Studies shall be recognised as transferring to candidature for the degree of

Bachelor of Arts with Honours in the Faculty of Military Studies provided that, by the end of his first year of enrolment for the degree of Bachelor of Arts in Military Studies he has completed or is deemed to have completed Course I of four subjects, that he has completed any other course or courses taken during that first year, that he has obtained a pass in Course I of the subject or subjects chosen for special study at a level determined by the Head(s) of the Department(s) concerned, that he has applied in writing to the Head(s) of the Department(s) concerned, and that the application has been approved by Faculty. Application to transfer to candidature for the degree of Bachelor of Arts with Honours may be made up to the end of the first week of second term in a student's second year of study provided that the student is already enrolled in the relevant pass course(s).

9. (1) If a candidate selects *one* subject for special study he shall complete the ten qualifying courses in one of the following combinations:
Either—

(a) Courses I, IIA and IIB each supplemented by additional honours work, IIIA and IIIB each supplemented by additional honours work, and IVH of the subject chosen for special study, together with one sub-major and one single course, or three single courses chosen from Schedule A1, and electives chosen from Schedule A2 to the value of one course.

or (with the approval of the Head of the Department offering the subject of special study)—

(b) Courses I, either of IIA or IIB each supplemented by additional honours work, IIIA and IIIB each supplemented by additional honours work, and IVH of the subject chosen for special study, together with two sub-majors or one sub-major and two single courses chosen from Schedule A1, and electives chosen from Schedule A2 to the value of one course,

where a sub-major is an approved sequence of a Course I and a Course II of one subject, and a single course is a Course I of a subject,
provided that

(i) every candidate shall complete the course History I (except for those taking history honours, candidates are not required to take a History II course)

(ii) the ten qualifying courses are, except with Faculty approval, completed according to the following time schedule:

First year: A Course I of the subject of special study; and *either* a Course I of each of two other subjects chosen from Schedule A1 together with chosen electives from Schedule A2, *or* a Course I of each of three other subjects chosen from Schedule A1.

Second year: *Either:*
Courses IIA *and* IIB of the subject of special study (each supplemented by additional honours work), together with the uncompleted pass level course required to comply with Rule 9 (1)(a);
or
Course IIA *or* IIB of the subject of special study (supplemented by additional honours work), together with the two uncompleted pass level courses required to comply with Rule 9 (1)(b).

Third year: Courses IIIA and IIIB of the subject of special study, each supplemented by additional honours work.

Fourth year: Military requirements in Schedule M.

Fifth year: Course IVH of the subject of special study.

(iii) to qualify for enrolment in course IVH a candidate shall have met all the requirements of the first four years and shall have obtained passes at credit level or better in all courses taken in the second and third years of the subject of special study.

9. (2) If the candidate selects two subjects for special study, he shall complete the ten qualifying courses in accordance with the following combination:

A Course I, a Course II (supplemented by additional honours work) and a Course III (supplemented by additional honours work) of each of the subjects chosen for special study, a Special Combined Course IVH embracing the same two subjects, together with a sub-major or two single courses chosen from Schedule A1, and one course chosen from Schedule A2, where a sub-major is as defined in Rule 9(1) and where the choice among options in a subject is subject to the approval of the Head of Department concerned,
provided that

(i) every candidate shall complete the course History I (except for those taking History honours, candidates are not required to take a History II course);

(ii) the ten qualifying courses are, except with Faculty approval, completed according to the following time schedule:

First year: A course I of each of the subjects chosen for special study together with *either* a Course I of another subject chosen from Schedule A1 and the electives chosen from Schedule A2, *or* Course I of each of two other subjects chosen from Schedule A1.

Second year: A Course II (supplemented by additional honours work) of each of the subjects of special study, together with the uncompleted pass level course required to comply with Rule 9 (2).

Third year: A Course III (together with prescribed additional honours work) of each of the subjects chosen for special study.

Fourth year: Military requirements in Schedule M.

Fifth year: Special Combined Course IVH.

(iii) to qualify for enrolment in the Special Combined Course IVH a candidate shall have met the same requirements as for Course IVH in Rule 9 (1).

10. There shall be no re-examination of Course IVH.

11. (1) A candidate for the degree of Bachelor of Arts with Honours in the Faculty of Military Studies who has successfully completed the academic requirements of the first three years and who has completed the requirements of Schedule M but who withdraws from or fails to meet the academic requirements of the fifth year shall, subject to the approval of Faculty, be deemed to have met the requirements for the degree of Bachelor of Arts in Military Studies.

(2) A candidate for the degree of Bachelor of Arts with Honours in the Faculty of Military Studies who at any stage in the second or third year withdraws or fails to meet the honours requirements may be required by Faculty to transfer to the program for the degree of Bachelor of Arts in Military Studies and shall take such courses as Faculty may determine.

12. Upon sufficient cause being shown, Faculty may in particular cases vary the requirements of Rules 4, 6, 8, 9 and 10, provided that any variation shall be initiated by a recommendation from a Head of Department concerned.

SCHEDULE A1

Subject	*Course*	
Economics	1610	Economics I
	2612	Economics IIA
	2612H	Economics IIA (Honours)
	2613	Economics IIB
	3612	Economics IIIA
	3612H	Economics IIIA (Honours)
	3613	Economics IIIB
	3613H	Economics IIIB (Honours)
	4602H	Economics IV (Honours)
English	1507	English I
	2507	English II
	2508	English II (Honours)
	3507	English III
	1508	Australian Literature
Geography	1954	Geography I
	2954	Geography II
	2964	Geography II (Honours)
	3954	Geography IIIA
	3955	Geography IIIB
	3964	Geography III (Honours)
	4953	Geography IV (Honours)
Government	1001	Government I
	2001	Government II
	2031	Government II (Honours)
	3021	Government III
	3031	Government IIIA (Honours)
	3032	Government IIIB (Honours)
	4032	Government IV (Honours)
History	1405	History I
	2407	History IIA
	2408	History IIAH
	2409	History IIB
	3408	History IIIA
	3409	History IIIA (Honours)
	3410	History IIIB
	3412	History IIIB (Honours)
	4405	History IV
Mathematics	1131	Mathematics IA
	1132	Mathematics IB
	2131	Mathematics IIA
	2132	Mathematics IIB
	2135	Mathematics IIA (Honours)
	2136	Mathematics IIB (Honours)
	3138	Mathematics IIIA (Honours)
	3139	Mathematics IIIB (Honours)
	4131	Mathematics IV

SCHEDULE A2

Chemistry	1306	Chemistry I
Physics	1203	Physics I
Science	1807	Chemistry and Society
	1808	Engineering and Society
	1809	Mathematics for Social Scientists
	1810	Physics for Arts Students

For science half-units in Schedule A2 refer p. 62. The Chemistry and Physics units are to be found on pp. 69 and 73 respectively.

Degree of Bachelor of Science in Military Studies

1. The degree of Bachelor of Science in Military Studies shall be conferred as a pass degree.

2. No person shall be permitted to enrol in any qualifying course for the degree of Bachelor of Science in Military Studies at the same time as he is enrolled for any other degree or diploma in this University or elsewhere.

3. Where, in the following Rules, reference is made to the requirement that a candidate shall complete a course, the requirement shall be construed as meaning that the candidate shall:

(a) attend such lectures, seminars and tutorials as may be prescribed in that course;

(b) perform satisfactorily in such exercises, laboratory work, essays and thesis (if any) as may be prescribed in that course; and

(c) pass the examination or examinations in that course.

4. A candidate shall not enrol in a course until he satisfies all prerequisite and corequisite conditions for that course, as specified by the appropriate department.

5. A major in a subject shall consist of Course II of value 8 points, and Course III of value 12 points in one

of the subjects of Chemistry, Computer Science, Geography, Mathematics or Physics.

6. A candidate for the degree of Bachelor of Science in Military Studies shall be required to complete both the academic requirements of the degree, as specified in Rule 8, and the military requirements of the degree, as specified in Rule 9.

7. The academic requirements specified in Rule 8 shall be completed over the first three years of the candidate's course and the military requirements specified in Rule 9 shall be completed over all four years of the candidate's course. In special circumstances an extension of time of one year may be granted to a candidate in which to complete either or both of the academic and military requirements.

8. **Academic Requirements.** A candidate shall complete the following:

(a) three courses chosen from Schedule S4, having regard to the conditions that:
  (i) all students are required to complete History C Part II; and
  (ii) no student shall be accredited with 1901 Geography A or 1902 Geography B if taken currently with or after Geography as a subject from Schedule S1.

(b) four of the courses specified in Schedule S1;

(c) additional courses of value 36 points, including at least one course from Schedule S2,and one course from Schedule S3,

subject to the following:

(i) the choice of courses from Schedules S2 and S3 must provide a major as defined in Rule 5;

(ii) a candidate shall complete at least one course in Chemistry or Physics chosen from Schedules S2 or S2A;

(iii) a candidate shall not take both Course II and Course IIA of a subject;

(iv) a candidate shall not take more than one of Course III, Course IIIA and Course IIIB of a subject.

Schedule S1		*Point Value*
1306	Chemistry I	4
1954	Geography I	4
1131	Mathematics IA	4
1132	Mathematics IB	4
1203	Physics I	4

Schedule S2		*Point Value*
2310	Chemistry II	8
2180	Computer Science II	8
2954	Geography II	8
2130	Mathematics II	8
2210	Physics II	8

Schedule S2A		*Point Value*
2311	Chemistry IIA	4
2181	Computer Science IIA	4
2956	Geography IIA	4
2131	Mathematics IIA	4
2211	Physics IIA	4

Schedule S3		*Point Value*
3310	Chemistry III	12
3180	Computer Science III	12
3955	Geography III	12
3120	Mathematics III	12
3203	Physics III	12

Schedule S3A		*Point Value*
3311	Chemistry IIIA	4
3181	Computer Science IIIA	4
3956	Geography IIIA	4
3121	Mathematics IIIA	4
3204	Physics IIIA	4

Schedule S3B		*Point Value*
3312	Chemistry IIIB	2
3182	Computer Science IIIB	2
3957	Geography IIIB	2
3122	Mathematics IIIB	2
3205	Physics IIIB	2

Schedule S4

1650	Economics A
1521	English A
2521	English B
1901	Geography A
1902	Geography B
1413	History C Part I
1413	History C Part II

9. **Military Requirements.** A candidate shall complete the program of training in the Military requirements as set out in Schedule M.

10. Upon sufficient cause being shown, Faculty may, in particular cases, vary the requirements of Rules 3, 5 and 8, provided that any proposed variation shall be initiated by a recommendation from a Head of Department concerned.

Bachelor of Science with Honours in the Faculty of Military Studies

1. In order to qualify for admission to this degree a candidate shall:

(a) satisfy the academic requirements for the degree of Bachelor of Science in Military Studies without proceeding to graduation;

(b) complete the military requirements set out in Schedule M; and

(c) achieve an acceptable level of performance in an extra year of full-time academic study beyond that required for the degree of BSc (Mil).

2. A student wishing to proceed to an honours degree must apply to the Head of the appropriate Department when he has completed the academic requirements for the degree of Bachelor of Science in Military Studies. His admission to honours candidature is granted by Faculty on the recommendation of the Head of the Department, and will be conditional upon his completing Schedule M.

3. A suitably qualified candidate may be admitted to an honours course in one of the following:

Chemistry
Computer Science
Geography
Mathematics
Physics

4. To qualify for admission to an honours course a student must have completed courses at required grades as determined by the Head of the appropriate Department prior to admission to the honours year. In order to ascertain any such special conditions a student contemplating honours is advised to consult the Head of the Department not later than the end of the second year of study.

5. An honours candidate must attend lectures, read and engage in such other work as required by the Head of the Department. He must also complete the subject 4413 History IIC or one further subject from Schedule S4 for the BSc (Mil) course.

Bachelor of Engineering in the Faculty of Military Studies

Subject to the approval of the appropriate Heads of Departments, a candidate who entered the course before 1975 may elect to be governed by the rules applying to candidates entering the course in 1975 and subsequent years. A student transferring in this way who has completed the industrial visits requirement of Rule 8(a) will not be required to satisfy the practical engineering experience requirement of Rule 8(b).

1. The degree of Bachelor of Engineering shall be conferred as a pass degree or as an honours degree. Honours may be awarded in the following categories:
Honours Class I
Honours Class II, Division I
Honours Class II, Division II

2. No person shall be permitted to enrol in any qualifying course for the degree of Bachelor of Engineering at the same time as he is enrolled for any other degree or diploma in this University or elsewhere.

3. Where, in the following Rules, reference is made to the requirement that a candidate shall complete a subject, the requirement shall be construed as meaning that the candidate shall:
(a) attend such lectures, seminars and tutorials as may be prescribed in that subject; and
(b) perform satisfactorily in such exercises, laboratory, drawing office and field work, essays and thesis, and examinations as may be prescribed in that subject.

4. Before a candidate's enrolment will be accepted for any subject, he must have completed the relevant prerequisite subjects shown in Schedules E2, E3, E4 and E5.

5. A candidate shall be required to complete the academic requirements of the degree, as specified in Rule 7, and the military requirements and practical engineering experience requirements as specified in Rule 8. The year of military studies shall be undertaken at such time that, in the opinion of the appropriate Head of Department, there is a reasonable expectation that the candidate could complete the remaining academic requirements in one further year.

6.—
(a) A candidate who entered the course before 1975 shall be required to complete all the academic, military and practical engineering experience requirements for the degree in not more than five years.
(b) A candidate entering the course in 1975 and subsequent years shall be required to complete all the requirements for the degree in not more than six years.

7. **Academic Requirements:**
(a) *Standard Program.* The candidate shall complete in the years prescribed the qualifying subjects prescribed for all engineering students and those pertaining to one particular branch of engineering as set out in Schedules E1, E2, E3 and E4. The general studies subjects are 1413 History C Part II and three others chosen from the list as set out in Schedule E5.
(b) *Non-standard Program.* Subject to the requirements of Rule 4 and time-tabling requirements and the approval of the appropriate Heads of Departments a candidate may be permitted to enrol in any one year in subjects selected from more than one of Schedules E1, E2, E3 and E4. Non-standard programs are subject to the general regulations of the Professorial Board regarding re-enrolment, and to the requirement that all subjects of Schedule E1 must be completed in the first two years of the course.

8. **Military Requirements and Practical Engineering Experience Requirements:**
(a) *Candidates entering the degree course before 1975.* The candidate shall follow the prescribed Schedule ME of military work and show that he has attained the required standards. He will participate in visits to engineering works and establishments as prescribed by the appropriate Head of Department.
(b) The candidate shall complete the prescribed Schedule M of military work and show that he has reached the required standards. A candidate proceeding on a standard program shall undertake Schedule M in the fourth year of his course. Before the completion of academic studies he shall complete a period of sixty working days of approved practical engineering experience.

9. Upon sufficient cause being shown, Faculty may, in particular cases, vary the requirements of Rules 3, 4 and 7, provided that any proposed variation shall be initiated by a recommendation from a Head of Department concerned.

Note.
1. The sixty working days of practical experience must be done in periods of not less than twenty working days each. The recommended periods are one of twenty days in any one of the long vacations following the first, second or third year of the course and one of forty days immediately before the final academic year. A total of twenty working days from immediately before and just after any Christmas holiday period will be satisfactory provided that the work is done in the service of a single employer

SCHEDULE E1 THE FIRST YEAR COURSE

All Engineering students
General Studies Subject
1131 Mathematics IA
1132 Mathematics IB
1273 Physics I
1303 Chemistry
1708 Engineering I

SCHEDULE E2 THE SECOND YEAR COURSE

		Prerequisite Subjects
All Engineering students		
General Studies subject		
2131	Mathematics IIA (Calculus II, Differential Equations II)	(1131)
Civil Engineering		
2183	Computer Science IIC (Numerical Analysis II)	(1131 and 1132)
2718	Engineering II	(1708, 1131 and 1132)
2725	Civil Engineering I	
3761	Applied Thermodynamics	
3750	Electrical Technology	(1273, 1131 and 1132)
Electrical Engineering		
2185	Statistics IIC (Probability and Statistics II)	(1131 or 1132)
2273	Physics II	(1131, 1132 and 1203 or 1273)
2746	Electrical Engineering I	(1131, 1132 and 1203 or 1273)
Mechanical Engineering		
2183	Computer Science IIC (Numerical Analysis II)	(1131 and 1132)
2718	Engineering II	(1708, 1131 and 1132)
2768	Mechanical Engineering I	(1708, 1273, 1131 and 1132)
3750	Electrical Technology	(1273, 1131 and 1132)

CHEDULE E3 THE THIRD YEAR COURSE

All Engineering students
General Studies subject

Civil Engineering

2185	Statistics IIC (Probability and Statistics II)	(1131 or 1132)
3750	Electrical Technology	(1273, 1131 and 1132)
3733	Civil Engineering II	(2725, 2718)

Electrical Engineering

3122	Mathematics IIIB (Complex Variable III)	(2131—Calculus II unit)
2183	Computer Science IIC (Numerical Analysis II)	(1131 and 1132)
3748	Electrical Engineering II	(2746, 2273 and 2185)
4707	Management Science	(1132, 2131)

Mechanical Engineering

3122	Mathematics IIIB (Complex Variable III)	(2131—Calculus II unit)
3750	Electrical Technology	(1273, 1131 and 1132)
3774	Mechanical Engineering II	(2768 and 2718)

SCHEDULE E4 THE FINAL YEAR COURSE

All Engineering students
General Studies subject

Civil Engineering

4707	Management Science	(1132, 2131)
4703C	Project and Thesis	(3733)
4725	Civil Engineering III	(3733)

Electrical Engineering

4703E	Project, Thesis and Specialist Lectures	(3748)
4742	Electrical Engineering III	(3748, 3122 and 2183)

Mechanical Engineering

4707	Management Science	(1132, 2131)
4703M	Project and Thesis	(3774)
4764	Mechanical Engineering III	(3774)

SCHEDULE E5 GENERAL STUDIES SUBJECTS

1650 Economics A
1521 English A
2521 English B
1901 Geography A
1902 Geography B
1413 History C Part I
1413 History C Part II

Military requirements for the degrees of Bachelor of Arts in Military Studies and Bachelor of Science in Military Studies

SCHEDULE M

1. All candidates for either degree shall undertake a common program of training in the subjects listed under the broad headings of Military Art, Military Science and Military Technology and the program shall extend over four years.

2. During each of the first three years, the requirements of the program shall, in the main, be completed in a five-week period prior to the commencement of the academic year and in a three-week period after the end of that academic year. However continuation training shall extend over the whole of the 30-week academic year.

3. The fourth year shall be devoted entirely to the military training program and shall extend over a period of 47 weeks.

4. The individual subjects contained in the program of military requirements are:
(a) *Military Art*
(i) Physical Education—Theory of physical

training applied to physical endurance, battle efficiency, general gymnastics and sport.

(ii) Military Law—History, principles and practices of Military Law.

(iii) Military Administration—Personnel, stores and finance in a theatre of operation; a study of logistic support.

(iv) Tactics—A study of the defence, withdrawal and attack phases of war and counter-revolutionary operations.

(v) Organisation and Management—Staff duties, training and intelligence.

(b) *Military Science*

(i) Arms Training—A detailed study of weapons support and facilities available from various branches of the Army—armour, artillery and nuclear support, Army aviation, military engineering, signals.

(ii) Topography—An advanced study of the principles of map and airphoto reading, position finding and navigation.

(iii) Field Projects—The application of the principles of tactics to the command of an infantry platoon; field exercises.

(iv) Military Experience—Attachment to a training unit to obtain practical military experience.

(c) *Military Technology*

(i) Military Weapons—Design, operation and maintenance of infantry weapons, firepower of current Army weapons.

(ii) Research and Development—Preparatory lectures and directed reading—visits and attachments to research and development establishments, Army Design Establishment, selected research institutions and industries.

Military requirements for the degrees of Bachelor of Engineering in the Faculty of Military Studies, Bachelor of Arts with Honours and Bachelor of Science with Honours in the Faculty of Military Studies

SCHEDULE ME

1. All candidates for the degree shall undertake a program of training in the subjects listed under the broad headings of Military Art, Military Science and Military Technology and the program shall extend over four years.

2. During each of the four years, the main requirements of the program shall be completed in a five-week period prior to the commencement of the academic year and in a three-week period after the end of that academic year. However, continuation training shall extend over the whole of the 30-week academic year.

3. The individual subjects contained in the program of military requirements are:

(a) *Military Art*

(i) Physical Education—Theory of physical training applied to physical endurance, battle efficiency, general gymnastics and sport.

(ii) Military Law—History, principles and practices of Military Law.

(iii) Military Administration—Personnel, stores and finance in a theatre of operation; a limited study of logistic support.

(iv) Organisation and Management—Staff duties, training and intelligence.

(b) *Military Science*

(i) Arms Training—Knowledge of weapons support and facilities available from various branches of the army—armour, artillery, army aviation, military engineering, signals.

(ii) Field Projects—The application of the principles of tactics to the command of an infantry platoon; field exercises.

(c) *Military Technology*

Military Weapons—Design, operation and maintenance of infantry weapons, firepower of current Army weapons.

Courses Offered by Departments

Department of Economics

Introduction

Economics I is intended to provide an introduction to economics, on which a further study of general and managerial economics may be built, and a self-contained, sufficiently broad unit which may be taken by students who do not want to pursue the subject further.

A pass or honours student wishing to take a sub-major in economics will take Economics I and Economics IIA, or Economics IIB.

A pass degree student, who takes a sub-major in economics, may take one additional economics course II in his second or third year (but after completing Economics I) towards a total of eight courses from Schedule A1 of the Rules for the pass degree.

A pass degree student wishing to complete a major in economics can do so *either* in Strand A (General Economics), by taking Economics I, Economics IIA and any two successive semester units out of Economics IIIA and IIIB, *or* in Strand B (Managerial Economics), by taking Economics I, Economics IIB and Economics IIIC.

A pass degree student taking a major in economics may take one additional course in Economics II or III towards his total of eight courses from Schedule A1 of the Rules for the pass degree provided that he meets the requirements of Rules 4 and 7.

An honours student wishing to major in economics may take courses I, IIA, IIB, IIIA, IIIB and IVH under Rule 9 (1)(a), or he may take Economics Courses I, IIA, IIIA, IIIB and IVH under Rule 9 (1)(b), which allows the completion of a second sub-major in place of completing Economics IIB.

An honours student who under Rule 9(2) takes two subjects, including General Economics, for special study, will take Economics I, IIA, and IIIA and a specially devised course IV embracing the two disciplines.

For the time being, honours students cannot be accepted in Managerial Economics.

1610 Economics I

Lectures 84 hrs
Tutorials 28 hrs
Practical 28 hrs*

SYLLABUS

Part I—Individual Economic Behaviour
1. Analysis of the basis of demand, the organisation and determination of supply.
2. The working of the price mechanism.
3. Introduction to theories of income distribution.

Part II—Aggregate Economic Behaviour
4. National product, national income and national expenditure, their meaning and significance; elementary social accounting.
5. Theory of income determination in closed and open economies; factors affecting consumption and investment; the influence of the government and overseas sectors; internal and external equilibrium.
6. Money and banking; the tools of monetary policy and their effectiveness; the interaction of aggregate demand and the money market.
7. International economic relationships.
8. Principles of economic policy; conflicts of aims; uses of policy instruments.
9. An introduction to alternative economic systems.

* All students of Economics I have to take and pass a one-hour-per-week course practising basic calculus, elementary statistics, some econometric techniques and introductory accounting. The practical course is designed also to cater for students who have not taken high-school mathematics recently.

2612 Economics IIA

Lectures 84 hrs
Tutorials 28 hrs

SYLLABUS

Part I—Microeconomic Theory
1. Household behaviour, the choice between work and leisure, consumption functions and demand functions for individual products.
2. Savings and portfolio planning; asset and flow decisions.
3. Producer behaviour, costs and supply functions.
4. Competition and market structures.
5. Spartial and intertemporary interdependence between individual markets.
6. A brief introduction to welfare economics.

Part II—Macroeconomic Theory
7. Elements of aggregate demand (private consumption, investment, public spending, exports).
8. Money and the level of aggregate demand.
9. Aggregate supply (production, the labour market, capital, imports).
10. Interdependence between the commodity, money, bond, labour and foreign-exchange markets; monetary theory.
11. Inflation and unemployment; internal and external balance.
12. Capital accumulation and economic growth.

2612H Economics IIA (Honours)

Lectures 84 hrs
Tutorials 28 hrs

Honours students have to cover the syllabus of course 2612, but will attend an additional tutorial and are expected to treat their work in greater depth and with more advanced analytical techniques.

2613 Economics IIB

Lectures 84 hrs
Tutorials 28 hrs

SYLLABUS

Part I—Business Economics
1. Management of economic systems, basic principles of rational management; objectives of the management in business and public finances.
2. Structure of the firm: factors of production, types of business enterprises, co-operation between firms.
3. The production process: production functions and costs.
4. Sales and marketing: instruments of sales policy, market research, pricing strategies.
5. Management: Information systems (accounting, valuation, cost accounting, business statistics), briefing techniques.
6. Management and organisation: Entrepreneurial psychology, objective functions, structure of management.

Part II—Management of Public Sector Economics
7. Public finance management: The budget process, accounting and costing in public finance; personnel management; efficiency analysis; Treasury control.
8. Evaluation techniques: Cost-benefit analysis, program budgeting.
9. Defence systems management: Applying economic techniques to defence economics; cost-benefit planning before investing; efficiency control.

This course will not be offered on an honours level in 1978.

3612 Economics IIIA

Lectures 84 hrs
Tutorials 28 hrs

SYLLABUS

Part I—Stabilisation and Growth Policy
1. The objectives of economic policy; some principles of policy making.
2. Macroeconomic theory: elements of aggregate demand, money and the level of demand; aggregate supply and the labour market; interdependence between commodity, money, bond, labour and foreign-exchange markets; inflation and unemployment; internal and external balance.
3. Stabilisation policy: monetary/fiscal strategies, exchange-rate policies, incomes and pricing policies; competition in commodity and factor markets and macroeconomic stability.
4. Capital accumulation and growth theories.
5. Policies for growth: The role of capital, skills and natural resources in long-term growth; technological change; structural change and factor mobility.

Part II—Special Issues of Economic Policy
6. International economic relations: Trade policies; international trade and industrial structure; problems of international capital flows; balance-of-payments stabilisation in the short and in the long run.
7. Market competition and economic performance: oligopolistic competition and growth; competition policies in Australia.
8. Problems of fiscal policy: taxation; expenditure; debt management; Federal-State financial relations.

3612H Economics IIIA (Honours)

Lectures 84 hrs
Tutorials 56 hrs

Honours students have to cover the syllabus of course 3612; but will have to do more reading and do more home work to cover more quantitative aspects of policy analysis.

3613 Economics IIIB

SYLLABUS

Lectures 84 hrs
Tutorials 28 hrs

Part I—Comparisons of Economic Systems: East-West
1. Types of economic systems; co-ordination of economic decisions by the market or by central planning; ownership of capital.
2. Basic features of Marxist economics.
3. Markets and central economic planning; consumption, investment, prices and incentives, growth performance of centrally planned economies; evaluation of market and Socialist economies.
4. East-West economic relations; Australia's economic relations with the Soviet bloc and China.

Part II—Comparisons of Economic Systems: North-South
5. Special problems of developing countries; population growth and labour surplus; the role of skills and capital in economic development; technology and the transfer and adaptation of developed-country technologies.
6. Stabilisation policies in developing countries; fluctuations in raw-material demand and prices; commodity agreements.
7. Agricultural and industrial development; the role of international trade in economic development; development planning.
8. Special problems of economic development in South-East Asia.

3613H Economics IIIB (Honours)

Lectures 84 hrs
Tutorials 35 hrs

Honours students have to cover the syllabus of course 3613, but to greater depth than pass students, and will have to study two selected topics (one from each of the two parts) for special study.

3614 Economics IIIC

(This will not be offered in 1978.)

Lectures 84 hrs
Tutorials 28 hrs

SYLLABUS

Part I—Case Studies in Management

1. Industrial management; planning of work schedules and production series; control of costs.
2. Forecasting of sales; sales strategies; exercises in combining instruments of sales policy (price, advertising; service; production variation).
3. Long-term plans of investment into capacity; financial plans.
4. Short-term management of cash flow; banking.
5. Interaction between firms; competition; oligopolistic competition; trade practices legislation; tariffs.

Part II—Case Studies in Public Finance

6. Applications of alternative budget techniques.
7. Planning of social, transport, or defence spending programs within the framework of long-range projections of the economy.
8. Improved information systems in the public sector; use of simulation models.
9. Applications of business-management techniques to defence management.

Economics IIIC will not be offered on an Honours level in the foreseeable future.

4602H Economics IV (Honours)

Lectures 56 hrs
Tutorials 56 hrs

SYLLABUS

1. Quantitative techniques; econometrics; input-output analysis.
2. Public finance: determinants of the size and structure of the public sector; public goods and economic welfare; externalities.
3. Pricing of public utilities; cost-benefit analysis applied to resource allocation in the public sector.
4. Income redistribution through taxation and public spending.
5. Economic appraisal of transport, water resource, recreation, regional and defence programs.
6. Defence economics.

1650 Economics A

Lectures 28 hrs
Tutorials 14 hrs

An introductory course designed for students of Engineering or Science.

Part I—Individual Economic Behaviour

Economic objectives; household choices (work-leisure; consumption-saving; portfolio allocation); basic choices by producers (production; production technique; cost; supply); the market place as a mechanism for co-ordinating individual choices (pricing; competition; interventions in markets; market place and central planning).

Part II—National Economic Behaviour

Overall demand; money and monetary policy; public finances; stabilisation policy; overall supply; economic growth of the productive potential; the role of technology in economic growth; international competition, growth and structural change.

Department of Geography

1954 Geography I

Lectures 56 hrs
Tutorials/Practicals 66 hrs
Local field excursions 24 hrs

This course is to be offered to Arts and Science students.

1. *Basic Aims*
(i) To provide continuing students in Geography with an integrated introduction to advanced studies from which they can select and build upon their specialist interests; and to provide non-continuing students with a general environmental science-geography background.
(ii) To provide an integrated approach to the understanding of physical, biological and human phenomena that take place at and near the surface of the earth; this involves an appreciation of:
(1) the dynamics of the lithosphere expressed by its moving plates;
(2) the dynamics of the biosphere with emphasis on organic evolution and ecological relationships, including the concept of the ecosystem;
(3) the dynamics of the atmosphere involving the distribution of energy fluxes and the formation of quasi-stable climatic states;
(4) the evolution of plants and man in relation to changes in climate during the Quaternary Period;
(5) the behaviour of social man in relation to environmental conditions; and
(6) human interaction placing emphasis on the dynamics of spatial relationships: introduction to spatial analytical methods of study.

2. *Course Structure*
(i) Geography I is divided into 2 semester sessions with 3 units in each session. Each unit represents a theme relevant to the various facets of modern geography and environmental science, and will be used to demonstrate the interaction of phenomena on the earth's surface at different time and space scales. Emphasis will be on the linkage between interacting biophysical and human aspects.
(ii) An examination will be held at the completion of each semester session.
(iii) Students will be required to complete tutorial and practical assignments including an introduction to basic statistical methods. Several field trips in the Canberra region are organised throughout the year in association with each unit.

The department stresses the need for students to apply their geographical knowledge to field situations.

3. *Syllabus*
Part 1: Principles of Geology.
Part 2: Principles of Biology.
Part 3: Principles of Climatology.
Part 4: Quaternary Environmental Change and the Evolution of Man.
Part 5: Human Environmental Interaction.
Part 6: Regional Evaluation and Spatial Analysis.

2954 Geography II

Lectures 56 hrs
Tutorials/Practicals 84 hrs
One five-day field excursion.

SYLLABUS

The course will be made up of three elective term units, one unit to be taken each term. The units available are:
1. Geomorphology
2. Biogeography
3. Environment and Society
4. Transport Geography
5. Social Geography
6. Behavioural Geography
7. Photogrammetry and Remote Sensing
8. Urban Systems
9. Medical Geography
10. Climatology and Meteorology
11. Systems and Models
12. Coastal Studies
13. Geography of the Third World
14. Strategic Geography
15. Geography of Information and Communication
16. Spatial Organisation and Location Analysis

1. *Geomorphology* A study of fluvial and coastal Geomorphology with emphasis on Australian examples. The practical work will provide an introduction to field and laboratory techniques in Geomorphology and students will be required to attend a field excursion.
2. *Biogeography* A consideration of the ecosystem with particular reference to ecosystems in Australia. A basic introduction to techniques of vegetation and soils mapping analysis and classification.
3. *Environment and Society* A consideration of man's impact of the environment with emphasis on the influence of urban areas.
4. *Transport Geography* Concerns Geography of transport and communication and contains an introduction to network analysis and allied techniques.
5. *Social Geography* Concerned with human environmental interaction and the process approach to the analysis of human geographical phenomena. It contains an introduction to the theory of decision making.
6. *Behavioural Geography* Concerned with process approaches to human environmental behaviour placing emphasis on environmental perception. It involves the systematic analysis of human behaviour patterns in diverse environmental contexts: e.g. urban, rural, political, military, recreational, etc.
7. *Photogrammetry and Remote Sensing* Deals with techniques of data collection and analysis through such media as air and satellite photography, and other modes of sensing such as radar, sonar, etc.
8. *Urban Systems* Concerned with the study of settlement and behaviour in the urban mode of human organisation. Studies are couched in the methodological framework of systems theory and analysis.
9. *Medical Geography* Involves the study of the ecology and distribution patterns of disease, nutrition and health.
10. *Climatology and Meteorology* Systematic studies of global weather and climate, including applied aspects. Involves consideration of data problems and techniques of analysis.
11. *Systems and Models* Essentially a course in modern geographical methodology. It aims to indicate the scope and versatility of modern geographical analytic techniques.
12. *Coastal Studies* Concerned with the study of the interface between marine and terrestial environments, from both a physical and a human standpoint.
13. *Geography of the Third World* General and specific studies of the geography of lands and cultures of the 'Third World', with specific reference to those which neighbour Australia and New Zealand.
14. *Strategic Geography* Concerned with the macro-analysis of global interactions of ideological, political, economic and military power, within and between human communities.
15. *The Geography of Information and Communication* Concerns the study of the nature and ecology of

information, and its communication through various media.
16. *Spatial Organisation and Location Analysis* Deals with geographical phenomena in terms of patterns and processes involved in the organisation of space, having some particular concern with theories of geographical location.

2964 Geography II (Honours)

As for 2954 Geography II plus a series of seminars which include additional and advanced work.

3954 Geography IIIA

Lectures 56 hrs
Tutorials/Practicals 84 hrs
One five-six day field excursion

SYLLABUS

The course will be made up of two elective term units and the course Terrain Evaluation and Community Development. The elective units will be chosen from those not taken in Geography II. The units offered are those offered in Geography II.

Terrain Evaluation and Community Development
A consideration of terrain evaluation and the Geographic approach to regional assessment. The bulk of the course consists of student research in the assessment of a particular area combining field, mapping and quantitative techniques. The culmination of the course will be the presentation of a combined report.

3955 Geography IIIB

Lectures 56 hrs
Tutorials/Practicals 84 hrs

This course comprises any three subjects not previously selected from the list of Geography options. Geography IIIB can only be undertaken concurrently with Geography IIIA, or subsequent to Geography IIIA.

3964 Geography III (Honours)

As for 3954 Geography IIIA and 3955 Geography IIIB plus a series of seminars which include additional and advanced work.

4953 Geography IV (Honours)

Candidates are required to:
(a) prepare a thesis of not more than 10,000 words,
(b) attend work-in-progress seminars conducted jointly with postgraduate students in related fields,
(c) attend seminars in geographical research methodology,
(d) attend seminars related to specific fields of thesis research.

1901 Geography A

A course of 42 lectures/tutorials/practical work for Engineering students, including:
(a) An introduction to ecology, with special emphasis placed on Biogeography and the influence of man and his works on environment, including the urban environment.
(b) An examination of the methods of terrain evaluation, with particular reference to the Land Systems approach and the PUCE (Province Unit Component Evaluation) method. Attention is also given to other models which are superseding land systems analysis, and to an introduction to autocorrelative and autoregressive methods of cartographic representation of climatological, biological and geomorphic data.
(c) Study of the role of photogrammetry as a basic method of remote sensing for terrain evaluation; extending to satellite meteorology and more advanced methods of remote sensing such as infra-red photography.

1902 Geography B

A course of 42 lectures/tutorials/practical work for Engineering students, including:
(a) An examination of human ecology in primitive and developed societies. Special consideration is given to modes of adaptation to and control over environment and to the side effects of such environmental behaviours.
(b) Study of the diffusion of peoples, ideas, technological innovations and cultures over the face of the earth.
(c) Population theory and dynamics, with special consideration of population trends in developed and underdeveloped societies during the 19th and 20th centuries.

Department of Government

1001 Government I

Lectures/Tutorials 100 hrs

SYLLABUS

1. An introduction to the principles and concepts of Democracy.
2. Democratic government in Australia.

2001 Government II

Lectures/Tutorials 100 hrs

SYLLABUS

Part I: Theories of revolution.
Part II: A study of the political system of the U.S.A.
Part III: A comparative study of communist politics.

2031 Government II (Honours)

50 hrs

A course of lectures/tutorials supplementing and extending Part I of the Government II pass course.

3021 Government III (A, B and C)

Lectures/Tutorials 112 hrs

Three courses are available in Government III, each consisting of two of the following half-year units:

1. The International System
2. Strategic Studies
3. The Politics of the Middle East
4. International Relations of Asia and the Middle East

Government IIIA consists of units 1 and 2; Government IIIB consists of units 3 and 4; Government IIIC consists of units 1 and 4. Students taking one course in Government III may choose any of these three courses. Students taking two courses in Government III may take IIIA and IIIB.

1. *The International System*
   (a) Theories of international relations.
   (b) The emergence and development of the international system up to 1945, including a study of sovereignty, the nature and functions of warfare, nationalism, ideology, diplomacy, international law, the balance of power and collective security.
   (c) The nature of contemporary international relations, including an analysis of the formation and goals of foreign policy, power and national interest, community and alliance, civil war and intervention, limited war, nuclear strategy, arms control and disarmament, international organisation.

2. *Strategic Studies*
Strategic doctrines and military policies since 1945 with special reference to the United States, the Soviet Union and Western Europe. Concepts of deterrence, limited war, strategic balance and arms control. The impact of nuclear weapons and the nature of contemporary strategy.

3. *The Politics of the Middle East*
A comparative study of the political systems of the contemporary Middle East.

4. *International Relations of Asia and the Middle East*
A study of international relations in Asia and the Middle East with special reference to the roles of the USA, USSR, China and Japan.

3031 Government IIIA (Honours)

The course will consist of units 1 and 2 listed under 3021 Government III (The International System and Strategic Studies) and a series of seminars on a related topic.

The seminars will be held throughout the year on Legal and Moral Problems of International Violence. Students will be required to submit a major essay and sit for an examination in this subject.

Legal and Moral Problems of International Violence 56 hrs

An examination of the relationship of politics, morality and law; the just war and aggression; war and the state in Hegel and Clausewitz; rules of warfare and war crimes; legal and moral dilemmas of nuclear weapons; private international violence; conscription and conscientious objection.

3032 Government IIIB (Honours)

The course will consist of units 3 and 4 listed under 3021 Government III (The Politics of the Middle East and International Relations of Asia and the Middle East) and a series of seminars on a related topic.

The seminars will be held throughout the year on Political Thought in the Middle East. Students will be required to submit a major essay and sit for an examination in this subject.

Political Thought in the Middle East 56 hrs

The development of political thought in the Middle East from the 7th century A.D. to the present.

4032 Government IV (Honours)

The course consists of lectures and seminars throughout the year on the following subjects:

1. Political Theory.
2. Strategic Studies.

In addition students will be required to prepare a minor thesis.

Departments of Government and History

4031 Combined Honours in Government and History

Students enrolled for combined honours in Government and History will, in respect of their work in the Department of Government, take the following two units, each of 14 weeks' duration:

1. *Theories of Authority and Rulership*

2. *Strategic Studies*
The nature and limits of strategic theory. The evolution of strategic doctrine and military policy since 1945 with special reference to the United States, and the Soviet Union and Western Europe. Ideas of deterrence, strategic stability and limited war. Problems of disarmament and arms control. The relationship between technology, strategic doctrine and military policy. Strategic problems of alliances with special reference to NATO and the German question.

In respect of their work in the Department of History, students will take the following unit:

Origins of the First World War
A detailed study of the foreign policy and diplomacy of the Great Powers 1902-1914; the role of Admiralties and General Staffs and their naval and military plans; the impact of the internal problems of the Great Powers on their foreign policy; historiographical controversies with particular reference to the Fischer thesis.

Department of History

1405 History I

Lectures 56 hrs
Tutorials 28 hrs

The course comprises a study of European and American history during the period 1748-1877.

Introduction
A brief examination of general trends since the Renaissance and Reformation.

Part I—1748-1787
The 18th-century monarchies with particular reference to France; the *Philosophes* and the intellectual revolution in Europe; the significance of the Seven Years War; the American Revolution and its impact on Europe; the origins of the Industrial Revolution and the French Revolution.

Part II—1787-1815
The fall of the French Monarchy and the establishment of the French Republic; the French Revolutionary Wars and the rise of Napoleon; the significance of the Consulate and the impact of the Napoleonic conquests on Europe; the principles of Napoleonic warfare and the generalship of Napoleon and Wellington; Federation and the rise of political parties in the United States.

Part III—1815-1849
Political and social trends in Britain and France 1815-48; Liberalism and Socialism; the growth of the United States and the long-term causes of the American Civil War; the revolutions of 1848.

Part IV—1850-1877
The coming of the American Civil War; the strategy of the war and Reconstruction; the character of the French Second Empire; Bismarck and the rise of Prussia; Moltke and the Prussian General Staff; the origins and significance of the Franco-Prussian War.

2407 History IIA

Lectures 56 hrs
Tutorials 28 hrs

The course comprises a study of European and American history during the period 1871-1962, with some consideration of major problems of Asian and African history during the period.

Part I—1871-1902
Political and social trends in Britain, France and Germany; social and economic changes in Russia and the United States; the modernisation of Japan; the growth of diplomatic and military rivalries between the European powers; the impact of Europe on Asia and Africa.

Part II—1902-1919
The Russo-Japanese War; the causes of the Russian revolutions of 1905 and 1917; the origins of the war in 1914; the strategy and politics of the First World War; the collapse of the German and Austrian empires; the Paris peace settlement; the Russian Civil War; the Chinese Revolution and the impact of the First World War on Asia.

Part III—1920-1939
Problems of postwar Europe and the USA; the Great Depression; the Stalin régime; the Chinese Civil War and the development of Sino-Japanese conflict; the rise of Fascism and Nazism; the Spanish Civil War; Hitler's policies and the outbreak of the Second World War.

Part IV—1939-1950
The technique of the Blitzkrieg and Hitler's conquests 1939-41; the German invasion of Russia; the strategy of the Pacific War 1942-45; the collapse of the Nazi Empire; the beginning of the Cold War; the Communist conquest of China.

Part V—1950-1962
The Cold War and containment—Korea, Indo-China and Vietnam; the emerging nations of Asia and Africa; nuclear weapons and the balance of power; the regime of Mao Tse-tung; the Cuban crisis 1962.

2408 History IIA (Honours)

Seminars 56 hrs

A series of additional special seminars for honours students running currently with the pass course, where the emphasis will be on problems of historiography. Students must submit a major essay and sit for an additional examination.

Alternative I: The Origins of the First World War (Will not be offered in 1978.)
A detailed study of the foreign policy and diplomacy of the Great Powers 1902-14; the role of Admiralties and General Staffs and their naval and military plans; the impact of the internal problems of the Great Powers on their foreign policy; historiographical controversies with particular reference to the Fischer thesis.

Alternative II: The Foreign Policy of the United States 1898-1950
The evolution of American Imperialism, the United States and the two World Wars; American relations with Latin America and Eastern Asia; the United States and the origins of the Cold War.

2409 History IIB

Lectures 56 hrs
Tutorials 28 hrs

The course comprises a study of Australian History 1788-1972 and is divided into two sections of equal weight.

Part I—Australia 1788-1900
Aspects of the political, social and economic history of Australia, 1788-1900; the British colonial background and the choice of Botany Bay; the convict system and the emergence of a free society; the search for a staple; exploration and the expansion of settlement; the problem of political authority; the land question; Church and State; the anti-transportation movement; Black and White Australian relations; the impact of the gold discoveries; the growth of primary and secondary industry; faction politics and the rise of the Labor Party; defence and imperial relations; the federation movement.

Part II—Australia 1901-1972
Political and social trends in Australia 1901-72 and Australia's foreign relations during the period.
Major strategic developments in 20th century warfare; Australian participation in 20th century wars.

3408 History IIIA

Lectures 56 hrs
Tutorials 28 hrs

The course is divided into two sections of equal weight.

Part I—The Impact of the West on Asia 1850-1905
Particular attention will be paid to the expansion of European Imperialism in the littoral states of the Indian Ocean.

Part II—India, China and South-East Asia 1905-65
A study of Asian nationalist movements in the area after 1905; the breakdown of Western colonial rule and the problems of the new Asian states, with emphasis on revolts and counter-insurgency after 1945. The course will concentrate on:
the Indian and Indonesian nationalist struggles;
revolutionary movements in China 1911-49;
the Huk movement in the Philippines;
the Malayan 'Emergency';
the Viet Minh and Viet Cong.

3409 History IIIA (Honours)

Seminars 56 hrs

A series of additional special seminars for honours students running concurrently with the pass course. Students must submit a major essay and sit for an additional examination.

The rise and eclipse of Japanese Military Power, 1873-1945.
A study of the development of the Japanese armed forces and their role in peace and war from the introduction of consciption to the end of the Pacific War.
The problems to be examined include:

- the relationship of the forces to Japanese society; dominance of the officer corps by Satsuma and Choshu; early penetration of politics by the military;
- the struggle for Korea; the war with China and its effects on the Japanese forces;
- the Russo-Japanese war; policy and strategy hand in hand; the Japanese performance on land; sea power in action—Togo and Tsushima; the war as a precursor of 1914-18;
- the failure of parliamentary government and the militarisation of Japan between the world wars; the Army and Manchuria; the invasion of China;
- the Japanese forces and their readiness for war with a major power; doctrine and command; the strategy of December 1941; the Pacific War.

3410 History IIIB

Lectures 56 hrs
Seminars 28 hrs

A course to be taken by honours students in their third year. The syllabus and recommended texts for this course are exactly the same as those for History IIB.

3412 History IIIB (Honours)

Seminars 56 hrs

A series of additional special seminars for honours students running concurrently with History IIIB. Students must submit a major essay and sit for an additional examination.

From Imperial Appendage to American Satellite?: Australia 1900-72
A study of Australian-British-American relations from Federation to the Whitlam government. Particular attention will be paid to the theory and practice of imperial defence between the wars and to the infusion of American interests into the Australian culture after the war.

4405 History IV

(This will not be offered in 1978.)

Part I—A course in Historiography and the Philosophy of History
A study of the methods and achievements of great historians from the 18th to the 20th century, and of theories of History during the period. Some attention will be paid to Australian historians.

Part II—A Special Subject
Origins of the First World War, Particular attention will be paid to Historiography and clashes of opinion between rival historical schools.

Part III—A minor thesis of approximately 10,000 words.

1413 History C

Lectures/Tutorials 84 hrs

A history course designed for students studying for a Science or Engineering degree.

The course comprises a study of politics and war in the 19th and 20th centuries.

Part I (This will not be offered in 1978.)
A broad survey of:
The characteristics of 19th-century Liberalism, Nationalism and Socialism; the impact of the First World War and Russian Revolution; the character of Fascist and Nazi regimes; the origins and significance of the Second World War; the Cold War and the rise of the Neutralist bloc; problems of emergent Afro-Asian powers; Australia's relations with Asia 1945-60.

Part II (To be offered to Science and Engineering students in 1978.)
A broad study of military theory and strategy in the 19th and 20th centuries.
Attention will be paid to:

(a) Napoleonic strategy; the American Civil War; Moltke and the rise of the Prussian General Staff.
(b) Military theories of the 20th century; the strategy of the First and Second World Wars; revolutionary warfare in Asia.
(c) Study in depth of a campaign, i.e. the Western Desert, June-November 1942.

4413 History IIC

Lectures 28 hrs
Tutorials 14 hrs

A history half-unit to be studied by honours students in Science in their fourth year. It comprises a study of World History 1919-62.

Part I—1919-1939
The Paris peace settlement; the impact of the First World War on Asia; problems of postwar Europe and the U.S.A.; the Great Depression; the Stalin regime; the Chinese Civil War and the development of Sino-Japanese conflict; the rise of Fascism and Nazism; the Spanish Civil War; Hitler's policies and the outbreak of the Second World War.

Part II—1939-1950
The technique of the Blitzkrieg and Hitler's conquests 1939-41; the German invasion of Russia; the strategy of the Pacific War 1942-45; the collapse of the Nazi Empire; the beginnings of the Cold War; the Communist conquest of China.

Part III—1950-1962
The Cold War and containment—Korea, Indo-China and Vietnam; the emerging nations of Asia and Africa; nuclear weapons and the balance of power; the régime of Mao Tsetung; the Cuban crisis 1962.

Department of Language & Literature

1507 English I

A course of 84 lectures, with tutorials, principally on Modern Literature (poetry since Yeats, drama since Ibsen, and fiction since Conrad), and on the history and use of the English language.

TEXTS

(i) Mack, M., Dean, L. and Frost, W. (eds), *Modern Poetry*
Macbeth, G. (ed.), *Poetry 1900 to 1965*
Hardy, *Selected Poems*
(ii) Ibsen, *The Wild Duck*
Shaw, *Man and Superman*
O'Casey, *Juno and the Paycock*
Ionesco, *The Chairs*
Brecht, *Mother Courage*
Eliot, *The Cocktail Party*
Pinter, *The Caretaker*
O'Neill, *The Emperor Jones; Long Day's Journey into Night*
Williams, *A Streetcar Named Desire*
Miller, *Death of a Salesman*
(iii) Emily Bronte, *Wuthering Heights*
Conrad, *Heart of Darkness*
Joyce, *Portrait of the Artist as a Young Man*
Cary, *The Horse's Mouth*
Fitzgerald, *The Great Gatsby*
Faulkner, *Go Down Moses*
Malamud, *The Assistant*
Ellison, *Invisible Man*
(iv) Barber, C., *The Story of Language*, Pan.
Brooks, C. and Warren, R. P., *The Fundamentals of Good Writing*, Dobson.

2507 English II

A course of 84 lectures, with tutorials, on Romantic and Realist Literature:
(i) English and American poetry (ii) English fiction (iii) American fiction, principally of the 19th century.

TEXTS

(i) Blake, *Selected Poems* (ed. Bateson)
Wordsworth (ed. Butt)
Coleridge (ed. Colmer)
Keats (ed. Sharrock)
Tennyson (ed. Millgate)
Browning (ed. Allott)
Arnold (ed. Watt)
Hopkins (ed. Storey)
Matthiessen, F. O. (ed.), *Oxford Book of American Verse*
(ii) Scott, *The Heart of Midlothian*
Jane Austen, *Northanger Abbey; Emma*
Dickens, *Bleak House*
George Eliot, *Middlemarch*
James, *The American; The Europeans; the Portrait of a Lady*
Conrad, *Nostromo*
Hardy, *Far from the Madding Crowd; Tess of the d'Urbervilles*
(iii) Cooper, *The Deerslayer*
Hawthorne, *The Scarlet Letter; The Celestial Railroad and other Stories*
Melville, *Moby Dick; Billy Budd and other Tales*
Twain, *Huckleberry Finn; The Mysterious Stranger and other Stories*

2508 English II (Honours)

As for English II, together with 56 lectures and tutorials on the following topics:
(i) Chaucer and History of Language;
(ii) Twentieth Century Australian Literature.

TEXTS

(i) Chaucer, *A Chaucer Reader* (ed. C. W. Dunn)
Chaucer, *The Works of Geoffrey Chaucer* (ed. F. N. Robinson)
Barber, C. L., *The Story of Language*
(ii) Slessor, K. *Poems* (with introduction and notes by Clement Semmler) (1972).
Wright, J., *Collected Poems, 1942-70*
Hope, A. D., *Collected Poems, 1930-70*
McAuley, J., *Collected Poems, 1936-70*
Richardson, H. H., *The Fortunes of Richard Mahony*
Furphy, J., *Such is Life*
Boyd, M., *Lucinda Brayford*
White, P., *The Eye of the Storm*
White, P., *Riders in the Chariot*

3507 English III

A course of 84 lectures, with tutorials, on Renaissance, Baroque and Neo-Classical literature.

TEXTS

Shakespeare, *Coriolanus, Romeo and Juliet, The Taming of the Shrew, Othello, Much Ado about Nothing*
Webster, *The Duchess of Malfi*
Tourneur, *The Revenger's Tragedy*
Jonson, *Volpone*
Ingram, W. G., and Redpath, T. (eds), *Shakespeare's Sonnets*
Clements, A. L. (ed.), *John Donne's Poetry*
Kenner, H. (ed.), *Seventeenth Century Poetry*
Bush, D. (ed.), *Milton: Poetical Works*
Frost, W. (ed.), *Selected Works of John Dryden*
Grant, D. (ed.), *Pope: Selected Poems*
Cruttwell, P. (ed.), *Samuel Johnson: Selected Writings*
Wimsatt, W. K. (ed.), *Dr Johnson on Shakespeare*
Johnson, *The Lives of the Poets.*

3508 English III (Honours)

The prescription for this course will be published at a later date.

3509 English IIIA (Honours)

The prescription for this course will be published at a later date.

4501 English IV (Honours)

The prescription for this course will be published at a later date.

1521 English A

(To be offered in 1979 and 1981.)

A course of 28 lectures and 14 tutorials on modern literature (including war literature) and on the types of prose discourse.

TEXTS

Brooks, C. and Warren, R. P., *The Fundamentals of Good Writing*, Dobson.
Waugh, *Sword of Honour*
Storey, *This Sporting Life*
Sillitoe, *Saturday Night and Sunday Morning*
Fitzgerald, *The Great Gatsby*
Malamud, *The Assistant*
Owen, *Poems*
Graves, *Goodbye to All That*
Hillary, *The Last Enemy*
Laird, J. T. (ed.), *Other Banners*
Gardner (ed.), *The Terrible Rain*

2521 English B

(To be offered in 1978 and 1980.)

A course of 28 lectures and 14 tutorials on modern Australian poetry and drama and Australian convict fiction.

TEXTS

Heseltine (ed.), *The Penguin Book of Australian Verse*
Three Australian Plays, Penguin
Four Australian Plays, Penguin
Lawler, *The Summer of the Seventeenth Doll*
Williamson, *Don's Party*
Warung, *Tales of the Convict System* (ed. Andrews)
Keneally, *Bring Larks and Heroes*
Clarke, *For the Term of his Natural Life*

1508 Australian Literature

(In 1978, this course is offered as a single English course only, and may not be used to form part of a major or sub-major in English.)

A course of 84 lectures, with tutorials, on Australian literature in the 19th and 20th centuries. Lectures will pay special attention to, but will not be confined to: Kendall, Brennan, Judith Wright, McAuley, Hope, Lawler, Seymour, Williamson, Clarke, Furphy, Boyd, Herbert, White, Lawson and Moorhouse.

Departments of Chemistry, Mathematics, Physics and the Engineering group of departments

These departments present Science half-units, any two of which may be completed to satisfy the requirement of one course from Schedule A2 in the Arts degrees. The other subjects available in Schedule A2 are the full subjects 1306 Chemistry I and 1203 Physics I which are described on pp. and respectively.

1807 Chemistry and Society

Lectures/Tutorials 56 hrs

SYLLABUS

(a) Basic vocabulary of chemistry: physical properties of substances; symbols, formulas and equations; molecular structure, periodic table; chemical energy; carbon compounds. (In this and subsequent topics reference will be made to the history and methodology of science.)
(b) Balancing benefits and risks; the nature of personal and societal risks; acceptable risk; chemical aspects of benefits and problems arising from man's use of automobiles, energy sources, aerosol propellants, supersonic transport, detergents, fertilisers, pesticides, food additives, medicinals, genetic engineering and other important issues which may arise from time to time.
(c) Military applications of chemistry: an introductory study of technical and social aspects of chemical warfare agents, including war gases, defoliants, crop destroying chemicals and riot control gases; high exlosives; gun propellants; solid and liquid rocket fuels; pyrotechnics.

1808 Engineering and Society

Lectures/Tutorials 56 hrs

SYLLABUS

(a) *Core Course*

Topic	
(1) Historical perspectives	Development of communications, power transportation, Scope of modern engineering
(2) Engineering approach to problem solving	Systems engineering, Mathematical models, Optimisation, Simulation
(3) Engineering approach to design	Identification, Creativity, Computer methods
(4) Engineering aspects of management	Methods engineering, Work study, Human engineering
(5) Engineering approach to resources	Planning, Allocation, Management of non-renewable resources
(6) Engineering and Society	Consequences of engineering, Environment, Potential of technology for sustaining life styles

(b) *Case Studies*
Approximately two studies to be considered in any one year. The list would be topical and would depend upon the interests of available staff. Typical subjects might be: Electric cars; Water recycling; Atmospheric pollution; Urban freeways; Alternative technologies; Nuclear power generation.

Four or five hours to be devoted to each study. For effective presentation the class will be divided into syndicates.

1809 Mathematics for Social Scientists

Lectures 42 hrs
Tutorials 14 hrs

The theme of the course is the role of mathematical thinking and computing in modern society, and a survey of some models and techniques relevant to social sciences.

SYLLABUS

(a) *Mathematical models.* A selection of various mathematical models used to describe real-world processes. These could include a drug model, a model for publishing, a model of the brain, a traffic-flow model, etc.
(b) *Probability and statistics.* Probability as applied to science and the humanities, description of sample data, graphical and tabular representation, derivation of data statistics; probability distributions, binomial, Poisson, normal.
(c) *Operations research.* Linear programming, two variable case with graphical solutions; optimization, one dimensional search techniques: games theory, two person games, competitive bidding techniques.
(d) *Computing.* Elementary computer principles, arithmetic, logic, sequence control; basic computing concepts, storage devices, characteristics and applications; applications of computers, data processing systems, simulation, interactive systems, real-time systems.
(e) *Mathematical applications in social sciences.* The mathematical techniques used in basic economic theory including differentiation, integration, and the exponential function. The mathematics of mapping and the application of mathematics to other sections of geography.

1810 Physics for Arts students

Lectures/Tutorials 56 hrs

SYLLABUS

(a) A comparative study of the validity and usefulness today of theories developed by man prior to 1900, with particular reference to: the atomic theory and the structure of matter; Newtonian mechanics; electro-magnetic radiation; the kinetic theory of matter. This study includes discussions of the scientific method, hypothesis and theory, and models.
(b) An introduction to the theories of the 20th century, particularly: nuclear and particle physics; special relativity and relativistic mechanics; Planck's quantum concept, wave properties of material particles.
(c) Peaceful and military applications of physics in some of the following areas: astrophysics; space research; the earth's atmosphere; nuclear energy; lasers; solar energy; plasma physics.

Department of Mathematics

The Mathematics Department provides courses which contribute towards the structure of all three first degrees offered by the Faculty. Students may undertake major studies in mathematics or computer science, or may study them in order to service the requirements of major studies in other disciplines. As with all other departments in the Faculty, the primary task of the Mathematics Department is to provide courses for students majoring within the department. Students may take mathematics or computer science as a major study for either the BA(Mil) or BSc(Mil) degree. In addition, the department provides courses for each of the four years of the BE degree.

Undergraduates for BA(Mil) may take any number of subjects offered by the department up to a maximum of six, which can enter the degree course as single subjects, sub-majors, major or double-major as defined in the rules for the award of the BA (Mil) degree. Undergraduates for BSc(Mil) may choose a variety of mathematics courses ranging from the minimum requirement to a full concentration in mathematics or computer science (equivalent to the double major for BA(Mil)) as defined in the rules for the award of the BSc(Mil) degree. Further, students who demonstrate the necessary competence may qualify for admission to the degree of either BA or BSc with Honours.

The four areas of study available in the department are as follows. Areas (a) and (b) come under the general heading of mathematics; and (c) and (d) under the general heading of computer science.

(a) *Pure Mathematics*
The pure mathematician is concerned with the study of mathematics for its own sake, the development of new techniques and theories and the endeavour to explore and understand better the relationships between the various parts of the subject. This course provides an introduction to the broad areas of analysis and algebra.

(b) *Applied Mathematics*
Applied Mathematics consists of the application of mathematical methods to problems arising in other fields. In this course the emphasis is on applications to physics and especially to fluid dynamics. The course provides an introduction to mathematical techniques of value to applied mathematicians and shows how these are used in the study of fluid dynamics and exterior ballistics.

(c) *Statistics and Operations Research*
Statistics and Operations Research are branches of mathematics that have been extensively developed because of the relevance of their techniques to applications in research and management. The aim of the course is twofold, firstly to develop the theoretical foundations of probability and statistics and linear programming, and secondly to investigate some of the applications to experimental and economic statistics and operations research.

(d) *Computer Science*
Computer Science concerns itself with the analysis of techniques and algorithms for the automation of numerical computation and information manipulation processes, and the study of automata for their implementation. The course is intimately bound up with the electronic digital computer, its design, operational characteristics and control, as well as its application to the problems of modern technology.

Outline of Subjects and Units

The department provides two first year mathematics subjects for study in any degree course. Both subjects will normally be taken by undergraduates for BSc(Mil) and BE and either or both may be taken by undergraduates for BA(Mil). Subjects in the second and later years are constructed from units which are combined in various ways to form subjects. This provides for flexibility to meet the varying needs of students, and also the requirements for service courses for all the degrees. These units are arranged in four strands corresponding to the four areas of study available in the department. In addition, special units are available for students proceeding with honours courses.

First Year

The two first year subjects are:
1131 Mathematics IA
1132 Mathematics IB

Second and Third Years

The second and third year subjects listed in the table below are constructed from units which are set out in the Schedules, A2, B2, C2 and D2 referred to as level 2 schedules, and A3, B3, C3 and D3 referred to as level 3 schedules.

Subject number	*Subject name*	*Number of units*	*Available in degree course**
2130	Mathematics II	4 mathematics	S
2131	Mathematics IIA	2 mathematics	A, E, S
2132	Mathematics IIB	2	A
2180	Computer Science II	4 computer science †	S
2181	Computer Science IIA	2 computer science	E, S
2183	Computer Science IIC	1 computer science	E
2185	Statistics IIC	1 computer science	E
3120	Mathematics III	6 mathematics	S
3121	Mathematics IIIA	2 mathematics	S
3122	Mathematics IIIB	1 mathematics	E, S
3131	Mathematics IIIA	3	A
3132	Mathematics IIIB	3	A
3180	Computer Science III	6 computer science ††	S
3181	Computer Science IIIA	2 computer science	S
3182	Computer Science IIIB	1 computer science	S

* A—Arts, E—Engineering, S—Science
† includes one laboratory unit
†† includes two laboratory units

Strand A—Pure Mathematics

Schedule A2	*Schedule A3*
Algebra II	Linear Algebra III
Analysis II	Analysis III
Calculus II	Complex Variable III
	Logic III

Strand B—Applied Mathematics

Schedule B2	*Schedule B3*
Differential Equations II	Ordinary Differential Equations III
	Partial Differential Equations III
Dynamics and Hydrodynamics II	Exterior Ballistics III
	Fluid Dynamics III

Strand C—Statistics and Operations Research

Schedule C2	*Schedule C3*
Operations Research II	Linear Programming III
	Operations Research III
Probability and Statistics II	Experimental Statistics III
	Mathematical Statistics III

Strand D—Computer Science

Schedule D2	*Schedule D3*
Digital Systems II	Digital Systems III
Numerical Analysis II	Numerical Analysis III
Programming II	Information Structures III
	Systems Programming III

Honours Units
One or more honours units may be offered within each strand.

Prerequisites

The relationship between units is established by prescribing prerequisites for advanced units rather than assigning units to years. The choice of units for all subjects requires the approval of the Head of the Mathematics Department and will be determined primarily by the interests of the student, but also by the availability of units.

Unit	*Prerequisites*
Schedule A2	
Algebra II	Mathematics IB
Analysis II	Mathematics IA
Calculus II	Mathematics IA
Schedule A3	
Linear Algebra III	Calculus II, Algebra II*
Analysis III	Analysis II
Unit	*Prerequisites*
Complex Variable III	Calculus II
Logic III	none
Schedule B2	
Differential Equations II	Mathematics IA
Dynamics and Hydrodynamics II	Mathematics IA, Calculus II*
Schedule B3	
Ordinary Differential Equations III	Calculus II, Differential Equations II
Partial Differential Equations III	Calculus II, Differential Equations II
Exterior Ballistics III	Calculus II, Differential Equations II, Dynamics and Hydrodynamics II*
Fluid Dynamics III	Calculus II, Differential Equations II, Dynamics and Hydrodynamics II*
Schedule C2	
Operations Research II	Mathematics IB
Probability and Statistics II	none
Schedule C3	
Linear Programming III	Operations Research II Numerical Analysis II* or Algebra II*
Operations Research III	Mathematics IB, Probability and Statistics II*
Experimental Statistics III	Probability and Statistics II, Numerical Analysis*
Mathematical Statistics III	Mathematics IA Probability and Statistics II
Schedule D2	
Digital Systems II	Mathematics IB, Physics I
Numerical Analysis II	Mathematics IB, Mathematics IA*
Programming II	Mathematics IB
Schedule D3	
Digital Systems III	Digital Systems II
Information Structures III	Programming II
Numerical Analysis III	Numerical Analysis II
Systems Programming III	Programming II

* may be taken concurrently

For the Degree of BA with Honours

A student intending to proceed to an honours degree will select specific units which are required for a major study in one or two of the strands available in the Department.

The choice of units in the second and third year will be subject to the approval of the Head of the Mathematics Department and will be made in such a way as to ensure that the student is properly prepared for the fourth year if he is admitted to it.

Second Year
There are two second year honours subjects:
2135 *Mathematics IIA (Honours)* consists of two units, together with additional honours work as specified by the Head of the Mathematics Department.
2136 *Mathematics IIB (Honours)* consists of two units, together with additional honours work as specified by the Head of the Mathematics Department.

Third Year
There are two third year honours subjects:
3138 *Mathematics IIIA (Honours)* consists of three units, of which one is an honours unit and two are level 3 units chosen from the strand in which the student intends to concentrate his honours work.
3139 *Mathematics IIIB (Honours)* consists of three units chosen so as to complement the subject 3138 Mathematics IIIA (Honours). One honours unit shall be included, and at most one level 2 unit.

Fourth Year
A student enrolled in the degree of *BA with Honours in the Faculty of Military Studies*, on his admission to the honours course in fourth year, will take the subject:
4131 *Mathematics IV (Honours)* consisting of specialised study in selected topics, together with an approved project in the strand in which the student is concentrating his honours work.

For the Degree of BSc with Honours

A student intending to proceed to an honours degree will select specific units which are required for a major study in one of the four strands available in the Department. The choice may include a maximum of two honours units.
The choice of units in the second and third year will be subject to the approval of the Head of the Mathematics Department and will be made in such a way as to ensure that the student is properly prepared for the fourth year if he is admitted to it.
On his admission to the honours course in fourth year the student will take one of the subjects:
4131 *Mathematics IV (Honours)*
4181 *Computer Science IV (Honours)* consisting of specialised study in selected topics, together with an approved project in the strand in which the student is concentrating his honours work.

Prescriptions for Subjects and Units

1131 Mathematics IA
A first course in mathematical techniques: vectors, differentiation, integration, differential equations.
Four periods per week throughout the year.
Vectors and elementary co-ordinate geometry; cartesian and plane polar co-ordinates, parametric equations, curve sketching. Scalar and vector products, triple products, applications to geometry.
Mathematical proof and notation. Order and inequalities. Introduction to number systems; mathematical induction. Relations and functions. Limits and continuity; an informal introduction.

Differentiation. Properties of functions; Rolle's theorem and mean value theorems, slope and concavity of graphs. Stationary points and points of inflexion, local and absolute extrema, applications to curve sketching and problems.
Integration; the definite integral as a sum, properties of integrals, antiderivatives, fundamental theorem of calculus.
Elementary functions; circular functions and inverses, logarithm and exponential functions, hyperbolic functions and inverses.
Integration techniques. Improper integrals. Application of integrals; areas, centres of mass, moments of inertia.
Elementary differential equations and applications.

1132 Mathematics IB
A course of essential topics in finite mathematics, including linear algebra, elementary series, probability and logic. The emphasis is placed on algorithms for problem solution and computer programming is introduced in the context of the mathematical topics.

Four periods per week throughout the year: Three lectures and one tutorial per week for the first semester; followed by two lectures and two practice class/tutorials per week for the second semester.

Introduction to statistics; presentation of data, mean and variance, calculation methods, calculators.

Digital computing; algorithms, flow charts, basic numerical and computer concepts, accuracy, precision and significance. Programming; FORTRAN language, problem analysis for computer solution, development and debugging techniques.

Series; convergence, looping algorithms, power series, evaluation of elementary functions, Taylor's series, iteration. Elementary logic; set notation, Venn diagrams, logical operations, truth table analysis. Complex numbers, Z-plane, de Moivre's theorem.

Program organisation; subprograms, scope of variables, segmentation, modularity. Structures; storage allocation, mapping functions, record I/O handling, subscript algebra, textual data.

Linear algebra; equation systems, determinants, Cramer's rule, nested looping, computer solution methods. Matrix algebra; notation, matrix types, algorithms for matrix operations, matrix inversion.

Application techniques; sorting, searching, solution of transcendental equations, integration. Monte Carlo methods, program efficiency.

Elementary linear programming, simple game matrix. Boolean algebra; de Morgan's theorems, circuit simplifications, arithmetic by logical operation.

Algebra II
A course in matrix algebra and group theory, and an introduction to other algebraic structures.

Two periods per week throughout the year.

Matrix methods, matrix algebra, linear transformations, determinants, inverse matrices, linear systems of equations, rank and linear dependence, special square matrices, eigenvalues, reduction to diagonal form.

Groups and other algebraic structures: sets, mappings, group axioms, special groups, subgroups, homomorphisms and isomorphisms, rings, fields.

Analysis II
An introduction to real variable analysis.

Two periods per week throughout the year.

Algebraic and topological properties of the set of real numbers.

Functions, limits, continuity, uniform continuity, mean value theorems and applications.

Theory of Riemann integral.

Convergence of sequences, series, and integrals; uniform convergence.

Lebesgue integral.

Calculus II
A second course in mathematical techniques involving multivariable calculus and integration in the context of scalar and vector fields.

Two periods per week throughout the year.

Functions of several variables. Composite functions; chain rules. Mean value theorem, Taylor's expansion. Extreme values; Lagrange multipliers, method of least squares.

Scalar and vector fields; differential operators. Line integrals; scalar potential and conservative vector fields. Area and volume integrals; geometrical and physical applications.

Surface integrals; vector flux, divergence and curl, cartesian representation, operator '∇'. Integral theorems; Green's theorem for the plane, Gauss' divergence theorem, Stokes' theorem.

Series; convergence, power series, Elementary functions of a complex variable.

Differential Equations II
A course in the techniques for solving ordinary differential equations, Laplace transforms, and Fourier series.

Two periods per week throughout the year.

First order differential equations; separation of variables, exact type, homogeneous type, linear and Bernoulli types.

Higher order differential equations; linear operator methods, constant coefficients, Cauchy type, variation of parameters, reduction of order.

Laplace transform; application to ordinary differential equations.

Series solutions of ordinary differential equations.

Fourier series; boundary value problems, separation of variables in a partial differential equation.

Dynamics and Hydrodynamics II
An introduction to the dynamics of a system of particles (classical dynamics) and the dynamics of a continuum (hydrodynamics).

Two periods per week throughout the year.

Particle dynamics; linear momentum principle, energy principle, projectiles.

Systems of particles; angular momentum principle, plane motion of a rigid body.

Classical hydrodynamics; one-dimensional channel flow, two-dimensional irrotational flow, applications to ground-water theory and water waves.

Operations Research II
A course in the methods of optimisation with emphasis on applications.

Two periods per week throughout the year.

Introduction; Operations Research concepts.

Linear Programming; algebraic and geometric solutions, simplex tableau, duality, sensitivity analysis.

Allocation; transportation and assignment models.

Optimisation; problem formulation, searching algorithms.

Dynamic Programming; applications to networks, single and multistage decision problems.

Games Theory; graphical and algebraic solutions, bidding models.

Probability and Statistics II
A generalised introduction to familiarise students with concepts which occur in experimental research material.

Two periods per week throughout the year.

Probability; combinatorials, conditional, independence, Bayes' rule.

Random variables; discrete, continuous, expectations, estimators, moments, grouped data.

Density functions; uniform, binomial, multinomial, hypergeometric, Poisson, negative binomial, normal, gamma, beta.

Sampling theory; X^2 distribution, 't' distribution, large samples, small samples, F distribution.

Estimation theory: maximum likelihood estimators, means, difference between means, proportions, variance, ratio of two variances.
Hypothesis testing: quality control, goodness of fit, independence.
Correlation and regression, single linear, multiple linear
Analysis of variance; one way, two way.

Numerical Analysis II
A course in numerical analysis and computational methods with emphasis on error analysis and algorithms for digital computer solution.
Two periods per week throughout the year.
Number systems; positional notation, base conversion.
Error propagation and noise in computation; round off error, truncation, estimating errors in machine computation, statistical approaches.
Matrices and simultaneous linear equations; inversion of matrices, eigenvalue problem, determinants Numerical solution of simultaneous linear equations, relaxation and iterative techniques.
Calculus of finite differences; polynomial approximations Interpolation of arbitrarily spaced data; Lagrange formulation, barycentric form.
Numerical quadrature, integration, and solution of differential equations; computer methods, stability. Runge-Kutta and predictor-corrector methods, two-dimensional partial differential equations, relaxation methods.

Programming II
A first course in programming at machine language level, together with a course in general computer applications
Two periods per week throughout the year.
Machine organisation; storage hierarchy, stored program concepts, machine instructions, addressing schemes. Assembly programming; mnemonic notation, pseudo-operations, indexing
Programming techniques; storage allocation, symbol manipulation, packing, floating point operations. Subprograms, scope of symbols, argument transfer, compiler-generated linkages, modular structures, linking and loading. Input-output; buffering, interrupt processing, introduction to multiprogramming.
Information processing; file structures, sequential and random access methods, file maintenance, sort-merge techniques, system design.

Digital Systems II
An introduction to the basic concepts in the design of digital systems and the organisation of digital computers.

This course is presented in conjunction with the Department of Electrical Engineering
Two periods per week throughout the year.
Boolean algebra; methods for the logical synthesis of switching networks, both combinational and sequential.
Utilisation of electronic devices as bivalue elements in digital systems.
Introduction to computer organisation.

Computation Laboratory II
A laboratory unit comprising the practical work for Computer Science II. It has the value of one unit.
Two periods per week throughout the year.
The particular laboratory assignments will be related to the specific units comprising Computer Science II.

Linear Algebra III
A course in the theory of vector spaces, the use of matrix operators on finite dimensional spaces, and a brief introduction to Hilbert spaces.
Two periods per week throughout the year.
Vector spaces; linear dependence, basis and dimension, real and complex spaces, Euclidean spaces, orthogonality, linear transformations.
Matrix operators; determinants, rank and equivalence, linear systems of equations, change of basis, orthogonal, and unitary matrices, congruence, symmetric and hermitian matrices.
Algebraic forms; bilinear forms, quadratic forms, hermitian forms, applications.
Characteristic polynomial, eigenvalues, similarity, diagonalisation. Matrix polynomials; Cayley-Hamilton theorem.
Hilbert spaces; euclidean spaces $E\eta$ and $E\infty$, complete spaces, function spaces, integral operators, Hilbert spaces, orthonormal sequences, basis for an infinite dimensional space.

Analysis III
A course in real and abstract analysis.
Two periods per week throughout the year.
General topology; topological spaces.
Topological linear spaces; metric spaces, normed linear spaces.
Daniell integral, Lebesgue integral.

Complex Variable III
A course in the theory of functions of a complex variable and some of its more immediate applications.
Two periods per week throughout the year.
Functions; limits, continuity, differentation, Cauchy-Riemann equations, analytic functions, conjugate harmonic functions, the elementary functions.
Integrals; curves in the complex plane, complex integrals, Cauchy's integral theorem, indefinite integrals, Cauchy integral formula, theorems on integrals.
Series, convergent sequences and series, convergence tests, uniform convergence, power series, Taylor series, Laurent series.
Residues and poles; isolated singularities and residues, the residue theorem, residues at a pole, isolated singularities at infinity, evaluation of real definite integrals by contour integration.
Conformal mapping; the elementary functions as mappings, conformal mappings, inverse functions, special mapping, the Schwarz-Christoffel mapping, applications.

Logic III
A first course in mathematical logic which develops both the heuristic approach with the emphasis on the use of logic, and the formal approach emphasising the deductive structure.
Two periods per week throughout the year.
Propositional truth-function logic; the propositional connectives, material implication, negation, equivalence, disjunction and conjunction. Truth tables, tautologies, self-contradictory and contingent propositions. Perfectly disjunctive and conjunctive normal forms. The use of truth-functional logic in the testing of arguments for validity or invalidity. The use of *reductio ad absurdum* and related methods.
First order predicate logic; the quantifiers. Free and bound variables. A Gentzen-like approach to the testing of arguments for validity or invalidity. Universal instantiation, universal generalisation, existential generalisation and existential instantiation.
A propositional calculus; object language and metalanguage. Primitive symbols and well-formed formulae. Axioms. Rules of inference. Consistency and completeness of this calculus.
A first order predicate calculus; primitive symbols and well-formed formulae. Axioms. Rules of inference. Consistency and completeness of this calculus.

Ordinary Differential Equations III
An introduction to the theory of ordinary differential equations.
Two periods per week throughout the year.
First order differential equations and systems; plane autonomous systems, phase plane analysis, stability.

Linear equations; general theory, homogeneous equations, independent solutions, non-homogeneous equations, the adjoint equation.
Special ordinary differential equations of second order, and properties of their solutions.
Boundary value problems; Sturm-Liouville theory, Green's functions.

Partial Differential Equations III
A course on the solution of partial differential equations and associated boundary value problems by separation of variables and by integral transforms.
Two periods per week throughout the year.
Derivation in particular physical contexts of second order linear partial differential equations of importance in physics and engineering; classification and general properties.
Special functions arising in the separation of variables technique.
Solution of boundary value problems by separation of variables.
Fourier series; finite Fourier transforms.
Integral transforms and inversion formulae; general discussion of transforms and properties, with the main emphasis on Laplace and Fourier transforms.
Solution of boundary value problems by integral transforms.

Exterior Ballistics III
A course on theorical and numerical methods used in Exterior Ballistics.
Two periods per week throughout the year.
Power law air resistance, aerodynamic drag, methods of measuring aerodynamic coefficients.
Normal equations of a trajectory and their numerical solution, standard meteorological functions.
Differential corrections; gravitational variations, rotating frames, Coriolis force, Euler force, centrifugal force, meteorological variations.
Approximate methods; Siacci, Euler.
Ballistic and firing tables, field gunnery.
Bombing and firing from aircraft.
Rockets.
History of ballistics.

Fluid Dynamics III
A course on the dynamics of incompressible, inviscid fluids with an introduction to the dynamics of viscous fluids.
Two periods per week throughout the year.
Equations of motion for inviscid, incompressible fluids. One-variable flow problems, e.g. spherically symmetric problems. Two-dimensional flow, circle theorems, use of conformal transformations, Joukowski aerofoils. Axially symmetric flow.
Equations of motion for viscous incompressible fluids. Exact solutions of the equations. Slow viscous flow. Introduction to boundary layer theory.

Linear Programming III
A detailed study of the theory of linear programming and the simplex tableau, with application to specific fields of Operations Research.
Two periods per week throughout the year.
Simplex Tableau; mathematical derivation.
Duality; derivation, validity, interpretation.
Sensitivity; ranging, availability charts.
Applications; games theory, allocation.

Operations Research III
The methodology of stochastic models and other topics of application to research and management.
Two periods per week throughout the year.
Queueing Theory; arrival and service distributions, queue discipline, single and multiple servers.
Markov Chains; persistent and transient states, closed sets, recurrent relations. Applications to models.
Network Analysis; generalisation of transportation model, scheduling, CPM, PERT, application to models.
Simulation; flow diagrams, random number generators, stochastic variable generators. Discrete, continuous and queueing models, inventory models.
Inventory Theory; deterministic and probabilistic models, price breaks, restrictions.
Replacement; discounting costs, anticipation of failure, reliability, group inspection problems.

Experimental Statistics III
An introduction to statistical models having applicational usages in all fields of experimental sciences and management.
Two periods per week throughout the year.
Regression Analysis; linear models, matrix approach, non-linear models.
Analysis of variance; single factors, factorial models, nested models, replication.
Sampling; general, stratified, cluster.

Mathematical Statistics III
An advanced treatment of Probability and Statistics from a mathematical viewpoint.
Two periods per week throughout the year.
Probability; random variables, combinatorials, conditional independence. Generating functions; characteristic functions. Applications; sums and products.
Limit laws. Estimation, hypothesis testing, sufficient statistics, dichotomous populations. Nonparametric statistics.

Numerical Analysis III
A second course in numerical analysis with emphasis on non-polynomial approximations.
Two periods per week throughout the year.
Linear approximations; orthogonal polynomials; Fourier series, expansions of discrete and continuous functions, Fast Fourier Transform. Sampling theory; band limited functions, smoothing functions. Curve fitting using L_1, L_2 and $L\infty$ norms.
Non-linear approximations; spline functions.
Pseudo-random number generation; congruential methods, Tausworthe generators.

Information Structures III
A course in the structuring of data elements and algorithms for the processing of data structures.
Two periods per week throughout the year.
Information structures, stacks, queues and dequeues, linked lists, trees, arrays and orthogonal lists, binary tree representation, multi-linked structures, dynamic storage allocation, organisation of files.
Symbiotics; interactive graphics, computer-aided design, computer-aided instruction.

Digital Systems III
A course in the hardware elements of computer systems, their architecture and reliability.

This Course is presented in conjunction with the Department of Electrical Engineering.
Two periods per week throughout the year.
Implementation of computer logic; transistor switching circuits, digital integrated circuits, computer organisation, memories.
Hardware elements and algorithms; logic design, state machines, gating and transfer functions, registers, algorithms for arithmetic operations, speed-up techniques.
Control functions; clock cycle and timing sequences, instruction repertoires, decoding and sequencing, interrupts, input-output control.
Input-output facilities; device characteristics, interfaces,

storage hierarchy, buffers, data channels, multiplexors.
Advanced addressing principles; memory paging, segmentation, and protection techniques.
Microprogramming.
Multiprocessors, high-speed and pipeline systems.
Computer systems reliability; error detection and correction, hardware diagnostic and monitoring features, environment control.

Systems Programming III
A course in system programming concepts and techniques including work on programming languages and operating systems.
Two periods per week throughout the year.
Systems programming; multi-precision arithmetic algorithms, macro-assembly, compiling techniques, recursion and re-entrance.
Programming Languages; Iverson notation, interpretive languages, interactive software, preprocessors, simulators.
Operating and supervisory systems; batch control, real-time concepts, multiprogramming, memory management, virtual memory, relocation, modularity, dynamic structures, protection, scheduling algorithms.
Data base management; communications systems, implementation aspects, multiprocessing.

Computation Laboratory IIIA
A laboratory unit comprising part of the required practical work for Computer Science III. It has the value of one unit.
Three periods per week throughout the year.
The particular laboratory assignments will be related to the specific units comprising Computer Science III.

Computation Laboratory IIIB
A laboratory unit comprising the practical work for Mathematics IIIB, and part of the required practical work for Computer Science III. It has the value of one unit.
Three periods per week throughout the year.
The particular laboratory assignments will be related to the specific units comprising Mathematics IIIB or Computer Science III.

1809 Mathematics for Social Scientists

Lectures 42 hrs
Tutorials 14 hrs

The theme of the course is the role of mathematical thinking and computing in modern society, and a survey of some models and techniques relevant to social sciences.

SYLLABUS

(a) *Mathematical models*
A selection of various mathematical models used to describe real-world processes. These could include a drug model, a model for publishing, a model of the brain, a traffic-flow model, etc.

(b) *Probability and statistics.*
Probability as applied to science and the humanities, description of sample data, graphical and tabular representation, derivation of data statistics; probability distributions, binomial, Poisson, normal.

(c) *Operations research.*
Linear programming, two variable case with graphical solutions; optimisation, one dimensional search techniques; games theory, two person games, competitive bidding techniques.

(d) *Computing.*
Elementary computer principles, arithmetic, logic, sequence control; basic computing concepts, storage devices, characteristics and applications; applications of computers, data processing systems, simulation, interactive systems, real-time systems.

(e) *Mathematical applications in social sciences.*
The mathematical techniques used in basic economic theory including differentiation, integration, and the exponential function. The mathematics of mapping and the application of mathematics to other sections of geography.

Department of Chemistry

1303 Chemistry

Lectures 30 hrs
Laboratory 30 hrs

LECTURE COURSE

(a) *Atomic and Molecular Structure*
Sub-atomic particles; electron arrangements in atoms; periodic classification; ionic and covalent structures; hydrogen bonds; van der Waals forces; crystal structures of metals and simple salts; relationships between physical properties and structure

(b) *Thermochemistry and Kinetics*
Heat of reaction; activation energy; rates of reaction; bond energies and heats of formation; the combustion of hydrocarbons

(c) *Macromolecules*
Basic organic chemistry and silicate chemistry; structures and properties of organic polymers, natural silicates and silicones.

(d) *Electrochemistry*
Voltaic cells; electrode potentials; redox reactions.

LABORATORY COURSE

Exercises designed to supplement the lecture course and introduce instrumental methods of analysis.

1306 Chemistry I

Lectures 78 hrs
Tutorials 26 hrs
Laboratory 78 hrs

Corequisite: Mathematics IA

LECTURE COURSE

(a) *Gases, Liquids and Solids*
Kinetic-molecular theory; intermolecular forces; liquid structures; solutions and solubility; phase equilibria; critical phenomena; crystal types; crystal lattices; lattice energies.

(b) *Thermodynamics*
The concepts of energy, entropy, enthalpy, free energy, chemical potential, equilibrium and equilibrium constant.

(c) *Equilibria in Gases and in Aqueous Solutions*
Gas phase problems; stability constants; acid-base equilibria; solubility equilibria; redox equilibria.

(d) *Atomic and Molecular Structure*
Quantum theory; atomic orbitals; electron arrangements in elements; ionisation energies; bonding; molecular geometry; molecular orbital theory; polarisation; bonding in metals.

(e) *Systematic and Descriptive Chemistry*
The Periodic classification; periodic properties; electronegativity; oxidation numbers; acidic and basic character of oxides and hydroxides; the solubility of salts; the chemistry of selected Groups and Periods; organic nomenclature and a survey of functional groups.

(f) *Rates and Mechanisms*
Rate constants; the notion of mechanism; activation energy; transition states; catalysis.

LABORATORY COURSE

Exercises introducing chemical techniques and supplementing the lecture course.

2310 Chemistry II

Lectures 4 hrs per week
Laboratory 4 hrs per week

Prerequisite: 1306 Chemistry I

OUTLINE OF COURSE
Topics amounting to eight points will be selected by taking topics (a), (b), (c), (d), (e), and *either* topics (f) and (g) *or* topic (h). Topics (a)-(e) and (g) count as one point each, (f) as two points and (h) as three points.

(a) *Electrochemistry and Thermodynamics*
The concepts of chemical potential, fugacity, activity and their application to the reaction isotherm. The Nernst equation and its application to simple cells with liquid junctions. The definition of activity coefficients of electrolytes and their determination in cells without liquid junctions. The determination of the thermodynamic quantities, ΔG, ΔH, ΔS, and E° and the application of cell thermodynamics to the determination of ionisation constants. The NBS scale of pH.

(b) *Spectroscopic Methods of Analysis*
Principles, applications and instrumentation of absorption, fluorescence, atomic absorption, emission, X-ray and reflectance spectroscopy for quantitative analysis. Precision and accuracy of spectroscopic methods. Laboratory techniques.

(c) *Introduction to Molecular Spectroscopy*
Brief survey of experimental techniques. Theory and application of rotational spectra, vibration-rotation spectra and electronic spectra. Bond-dissociation energies.

(d) *Inorganic Chemistry and Bonding A*
Chemical bonding, structure and stereochemistry in selected compounds of main group elements of Groups II-VI.

(e) *Inorganic Chemistry and Bonding B*
Molecular symmetry elements and their relationship to symmetry operations and point groups; molecular point group character tables; chemical applications of symmetry.

(f) *Organic Chemistry A*
Bonding and reactivity in organic compounds. Reactions classified by mechanism. Stereochemistry. Application of these basic concepts to: hydrocarbons, alcohols, phenols, carbonyl compounds, sugars, carboxylic acids and derivatives, ethers, epoxides, aromatic compounds, nitrogen-containing compounds. An introduction to infra-red and ultra-violet spectroscopy.

(g) *Organic Chemistry B*
Further consideration of stereochemistry and reaction mechanisms. Application of basic concepts to some other functional groups: alkyl halides, dienes, aryl halides, carbonyl compounds (carbanion chemistry), α, β-unsaturated carbonyl compounds, diazonium salts.

(h) *Organic Chemistry L*
A basic course in mechanistic organic chemistry for chemistry majors, developing the relationship between structure, bonding and reactivity as a way of understanding the properties and reactions of complex molecules.
Topics: types of organic molecules, conjugated bonds, resonance and aromaticity, stereochemistry, classification of organic reactions, reaction energetics, nucleophilic addition to carbonyl compounds, elimination reactions, electrophilic addition to π systems, molecular rearrangements, oxidation and reduction, radical reactions; an introduction to infra-red and ultra-violet spectroscopy and the chemistry of polymers.

2311 Chemistry IIA

Prerequisite: 1306 Chemistry I
Topics amounting to four points will be selected from the list

appearing under 2310 Chemistry II. A student's selection will be subject to the approval of the Head of the Department.

3310 Chemistry III

Lectures 5 hrs per week
Laboratory 12 hrs per week

OUTLINE OF COURSE

Topics amounting to twelve points will be selected. Topics (a), (b), (c) and (d), each with a value of one point, must be selected. The remaining eight points will be obtained by a selection from topics (e) to (t), each having a value of two points.

The following constraints apply. Students should comply with all prerequisites and corequisites. Only eight of the optional two-point topics will be available each year. These optional topics will be presented in four pairs. One topic from each pair is to be selected. A student's selection will be subject to the approval of the Head of the Department.

(a) *Analytical and Preparative Inorganic Chemistry*
Prerequisite: Inorganic Chemistry and Bonding A.
Corequisite: Electroanalytical Chemistry.

A variety of laboratory assignments will be completed which involve synthetic chemistry, analytical chemistry and the use of modern physico-chemical methods and instrumentation to confirm electronic structure and stereochemistry. Assignments requiring use of the chemical literature will be completed.

(b) *Instrumental Analysis of Organic Compounds*
Prerequisites: Spectroscopic Methods of Analysis.
Organic Chemistry A.

The application of nuclear magnetic resonance, infra-red, ultra-violet and mass spectrometry to the determination of structures of organic compounds. Combined gas chromatography-mass spectrometry and computer techniques.

(c) *Electroanalytical Chemistry*
Prerequisite: Electrochemistry and Thermodynamics.
Corequisite: Analytical and Preparative Inorganic Chemistry.

The accurate measurement of pH; pH-titrations. The electrolytic conduction of electrolytes, ionic conduction at zero concentration, conductimetric titrations. Voltammetric methods and their use in the analysis of trace amounts of some important electroactive species.

(d) *Inorganic Chemistry*
Prerequisites: Inorganic Chemistry and Bonding A.
Inorganic Chemistry and Bonding B.
Corequisite: Analytical and Preparative Inorganic Chemistry.

Chemical bonds involving d-orbitals. A study of transition metal complexes including nomenclature, isomerism, preparative methods, stability, theory of bonding, stereochemistry, electronic spectra and magnetism. Typical complex chemistry of the first transition series metals.

(e) *Molecular Spectroscopy*
Prerequisite: Introduction to Molecular Spectroscopy.

Multielectron atomic orbital theory; vector coupling. Molecular orbitals; united-atom correlation diagrams. Molecular models; rigid rotor, symmetric top. Hund's rules. Symmetry and selection rules. Nuclear spin effects and level populations. Introduction to molecular group theory.

(f) *Chemical Physics*
One or more topics from the list below will be given in any year. These topics will be designed to demonstrate the use of mathematical and theoretical techniques in describing physical phenomena in chemical systems.

The topics are: regular solution theory; reaction rates; molecular group theory; advanced thermodynamics; critical phenomena and phase theory; liquid crystals.

(g) *Statistical Thermodynamics*
Prerequiste: Electrochemistry and Thermodynamics or equivalent.

Introduction to distributions and calculation of thermodynamic properties. Translational partition function. Internal partition function. Heat capacities. Entropy and third law of thermodynamics. Equilibrium constants. Computation of thermodynamic functions from spectroscopic data.

(h) *Applied Physical Chemistry*
Prerequisites: Electrochemistry and Thermodynamics.
Organic Chemistry A.

Two topics to be selected from the following:

(i) The Nature of Surfaces and Adsorption
The liquid-liquid interface, surface free energy, the Gibbs equation. Ionic colloids and colloidal behaviour. The gas-solid interface, isotherms, heterogeneous catalysis.

(ii) The Physical Chemistry of some Important Industrial and Biological Processes.
A revision of basic thermodynamic relationships. Case studies of some industrial processes including kinetic considerations. Free energy considerations in biological processes, the citric acid cycle.

(iii) The Physical Chemistry of Flames and Explosions
Basic definitions and the physico-chemical properties of explosives. A study of effects associated with flames. The burning of propellants and explosives, reactions in solids, the hydrodynamic theory of detonation.

(i) *Applied Electrochemistry*
Prerequisite: Electrochemistry and Thermodynamics.
Corequisite: Electroanalytical Chemistry.

Electrodeposition reactions and their industrial applications. Corrosion theory, types of corrosion cells, factors involved in corrosion, passivity. The corrosion of iron and steel under various conditions. The corrosion of selected non-ferrous metals. Electrochemical energy conversion, the thermodynamic and kinetic factors to be considered in the construction of fuel cells and storage batteries.

(j) *Advanced Inorganic Chemistry*
Prerequisites: Inorganic Chemistry and Bonding A.
Inorganic Chemistry and Bonding B.
Corequisite: Inorganic Chemistry.

Advanced chemistry of selected main group elements involving study of synthesis, bonding and stereochemistry in selected compounds or classes. The chemistry of organometallic compounds including carbonyl, nitrosyl and π-complex systems. The application of spectroscopic methods and magnetochemistry to problems in inorganic chemistry.

(k) *Applied Inorganic Chemistry*
Prerequisite: Inorganic Chemistry and Bonding A.

The chemistry of the lanthanide elements (briefly), and of the actinides, in particular thorium, uranium and plutonium. Applications in nuclear technology. Lattice defects and non-stoichiometry. Applications of non-stoichiometric systems. Radiochemistry and radiochemical techniques. Chemical

effects of ionising radiation. Applications of isotopes in chemistry, engineering, medicine and agriculture.

(l) *Organic Chemistry*
Prerequisites: Organic Chemistry A and Organic Chemistry B.
or Organic Chemistry L.

Pericyclic reactions, photochemistry, design of organic syntheses, five-membered and six-membered heterocycles, structure and biosynthesis of some natural products.

(m) *Applied Organic Chemistry*
Prerequisite: Organic Chemistry A.
Petroleum, petroleum refining, lubricating oils, greases. Production of primary petrochemicals. Syntheses based on primary petrochemicals. The organic chemical industry, international and Australian. Explosives, physico-chemical aspects, manufacture and formulation. Dyes and dyeing.

(n) *Organic Macromolecules*
Prerequisite: Organic Chemistry A.
Course limit: Six students.

Thermodynamics of polymer solutions: Flory-Huggins theory; colligative properties. Methods of M. W. determination: end-group analysis; colligative properties analysis; solution viscosity; ultracentrifugation; light scattering. Preparation and kinetics of polymerisation: condensation, free radical, anionic and cationic and co-ordination polymerisations. Commercial polymers: structure-property relations; uses; methods of determination.

(o) *Chemistry of Industrial Materials and Processes*
Water, large scale purification processes. Metals, crystalline structure and imperfections, phase equilibria. Ceramics, including silicate minerals, glasses and cements. EITHER ultra-purification processes and some new materials OR organic polymers, terminology, structure-property relations, uses (The alternative, organic polymers etc., will not be available to students taking the two-point topic, Organic Macromolecules.)

(p) *Environmental Chemistry*
Prerequisite: Organic Chemistry A.
The chemical effects of energy production, chemical industry, agriculture and urban living on the environment. Analysis and monitoring of pollutants.

(q) *Biological Chemistry*
Prerequisite: Organic Chemistry A.

Structure of different types of protein. Enzymes, mechanism of action, inhibition, respiratory enzymes. Chemotherapy, selective toxicity, some mechanisms of drug action and drug resistance. Chemical and biological warfare agents, source, nature, mode of action, detection, decontamination.

EITHER, chemistry of heredity, function of nucleic acid in heredity and enzyme synthesis, replication of DNA, heredity defects, radiation damage; OR metals in biological processes, a study of the biochemistry of metals.

(r) *Photographic Chemistry*
Prerequisites: Organic Chemistry A.
Electrochemistry and Thermodynamics.

Photochemistry of silver halide crystals. Chemistry and kinetics of development. Superadditivity. Secondary chemical processes. Spectral and supersensitisation by organic dyes. Non-silver halide photosensitive systems.

(s) *Chemical Equilibria in Aqueous Systems*
Prerequisite: Electrochemistry and Thermodynamics.

The ionisation of polyfunctional acids and bases, the theory of buffer action. Dissolved CO_2 in aqueous systems, the precipitation and dissolution of naturally occurring oxides, hydroxides and carbonates. Metal ions and ligands, metal ion buffers, organic complexes in natural waters. The regulation of the chemical composition of natural waters.

(t) *Selected Special Topics*
Lectures based on the specialist interests of staff may be presented in a given year. It may be appropriate to combine such lectures with parts of certain other Third Year topics.
Examples of lectures based on staff interests are:
Organic geochemistry
Thermodynamics of irreversible processes
Chemistry of nuclear technology
Chemistry of food
Linear free energy relationships

3311 Chemistry IIIA

Topics amounting to four points will be selected from the lists appearing under 3310 Chemistry III and 2310 Chemistry II but may not include more than two points from the latter.

Topics chosen from 3310 Chemistry III are subject to the constraints given under 3310 Chemistry III. The following topics may be preferable because the laboratory component is reduced: Topics (e), (f), (g), (k), (m), (o), (q) and (s). Any of the remaining topics in 3310 Chemistry III and 2310 Chemistry II may be chosen, subject to the student being able to complete the laboratory component within the framework of the current Science time-table. In some special situations, a student choosing a lecture course with a laboratory component which conflicts with other commitments may, with the approval of the Head of the Department, be allowed to complete a special project in lieu of the prescribed laboratory component.

Students who choose topics from 2310 Chemistry II will be examined at a higher level than students enrolled in 2310 Chemistry II. A particular topic will not be open to students who have completed the corresponding topic under 2310 or 2311.

A student's selection will be subject to the approval of the Head of the Department. Ordinarily he will require the completion of Organic Chemistry A or its equivalent.

3312 Chemistry IIIB

Topics amounting to two points will be selected from the lists appearing under 3310 Chemistry III and 2310 Chemistry II. The same suggestions, conditions and constraints given under 3311 Chemistry IIIA apply.

4301 Chemistry IV

The course will consist of study in a specialised field of chemistry and will comprise such lectures, seminars, examinations, research projects, reports, as prescribed by the Head of the Department of Chemistry.

1807 Chemistry and Society

Lectures/Tutorials 56 hrs

SYLLABUS

(a) Basic vocabulary of chemistry: physical properties of substances; symbols, formulas and equations; molecular structure, periodic table; chemical energy; carbon com-

pounds. (In this and subsequent topics reference will be made to the history and methodology of science.)

(b) Balancing benefits and risks: the nature of personal and societal risks; acceptable risk; chemical aspects of benefits and problems arising from man's use of automobiles, energy sources, aerosol propellants, supersonic transport, detergents, fertilisers, pesticides, food additives, medicinals, genetic engineering and other important issues which may arise from time to time.

(c) Military applications of chemistry: an introductory study of technical and social aspects of chemical warfare agents, including war gases, defoliants, crop destroying chemicals and riot control gases; high explosives; gun propellants; solid and liquid rocket fuels; pyrotechnics.

Department of Physics

1203 Physics I

Corequisite: Mathematics IA

Lectures 84 hrs
Practical 84 hrs
Tutorials 28 hrs

General Physics and Mechanics
Physical quantities, units, standards and measurements; dimensions and dimensional analysis; co-ordinate systems. Newton's laws of motion, kinematics and dynamics. Momentum, energy, work and power. Rotational dynamics, moment of inertia, angular momentum. Newton's law of gravitation. Kepler's laws. Simple harmonic motion and resonance.

Electricity and Magnetism
Coulomb's law, calculations of electric fields and potentials. Gauss' law, multipoles, conductors and electric currents. Ohm's law and origins of electrical resistance, electrical measurements, Kirchhoff's rules and circuit analysis. Capacitance. Magnetic induction, motion of charges in electromagnetic fields. Biot-Savart and Ampere's laws. D.C. instruments. Electromagnetic induction, Faraday's law, inductance. Analysis of RL, RC and RLC circuits.

Properties of Matter and Heat
Temperature, thermometry, heat capacity. First law of thermodynamics. Heat transfer processes. Kinetic theory of gases. States of matter, phase changes and latent heat. Solids, expansion, conduction and elastic moduli. Liquids, surface tension, hydrostatics, hydrodynamics, Bernoulli's theorem.

Wave Motion and Optics
Classification of waves, superposition, Doppler effect, resonance, Huygen's principle, electromagnetic waves, polarisation, reflection, refraction and diffraction. Resolving powers of instruments.

Atomic and Nuclear Physics
Particles and waves, the uncertainty principle, introduction to wave mechanics. The Rutherford nucleus and scattering. The Bohr atom. Optical and X-ray spectra. Nucleons, stable nuclei, radioactivity, fission and fusion.

1273 Physics I

Lectures 84 hrs
Practical 63 hrs
Tutorials 28 hrs

SYLLABUS

The course is the same as 1203 Physics I with a reduction in laboratory work related to electrical experiments.

Second year courses in physics.

OUTLINE OF TOPICS

The point value of each topic is as indicated.

(a) *Electronics and Circuit Theory* (1½ points)
Linear electric circuits, transient and steady state responses. Thevenin's theorem, superposition, resonance. Semiconductors, the pn junction, junction transistors and applications.

(b) *Thermodynamics and Statistical Mechanics* (1 point)
Thermodynamic variables, state of a system, equilibrium and reversibility. Laws of thermodynamics. Kelvin temperature scale. Entropy. Thermodynamic functions and Maxwell's relationships. Application of thermodynamics to different systems. Adiabatic demagnetisation. Statistical Mechanics: introduction, Maxwell-Bolzmann statistics, Fermi-Dirac and Bose-Einstein statistics, applications.

(c) *Atomic and Nuclear Physics* (1 point)
Quanta of radiation, photoelectric effect, Compton effect. Origin of spectra, quantum states, hydrogen atom. Excitation and absorption. X-ray spectra. Wave mechanics: de Broglie's postulate, Davisson and Germer experiment, Schroedinger's equation, solution of Schroedinger's equation, uncertainty principle. Nuclear structure, stable nuclei, radioactivity. Detectors. Nuclear reactions. Energy.

(d) *Relativity* (½ point)
Galilean relativity. Michelson-Morley experiment. Einstein's postulates. Lorentz transformations. Simultaneity. Length contraction, time dilation. Relativistic mass, relativistic mechanics, mass-energy equivalence.

(e) *Solid State Physics A* (1 point)
Lattice dynamics, homogeneous medium, monatomic and diatomic arrays, infra-red absorption, lattice energy of ionic solids. Thermal properties of solids, specific heat, Einstein, Debye models. Crystal physics, structure, Miller indices, reciprocal lattice. Laue, Bragg diffraction equation. Structure factors.

(f) *Solid State Physics B* (½ point)
Structure determination: production and absorption of X-rays, mono- and poly-crystalline diffraction methods; electron microscopy and diffraction, elementary electron optics, specimen preparation, interpretation of single crystal diffraction patterns.

(g) *Magnetic Materials* (½ point)
Diamagnetism, Paramagnetism, Ferromagnetism. Hysteresis and the magnetisation curve. Ferromagnetic domains and domain walls.

(h) *Electricity and Magnetism A* (2 points)
Electrostatic field, flux, and potential; Gauss' law and divergence, circulation and curl. Material media: conductors, capacitance, dielectrics, boundaries. Methods of solution: uniqueness, images, use of Laplace's equation. Dipoles and multipole expansion. Electric currents: continuity, boundaries, complete circuits and e.m.f.s. Magnetic force between currents, magnetic induction, flux and divergence. Ampere's law and curl. Scalar and vector potentials. Ampere's law modified. Induced e.m.f. Maxwell's equations. Electromagnetic plane waves in unbounded media. Energy density and energy flow.

(i) *Electricity and Magnetism T* (1 point)
Electrostatic field, flux and potential; Gauss' law and divergence, circulation and curl. Material media: conductors, capacitance, dielectrics, boundaries. Electric currents and current density, complete circuits and e.m.f.s. Magnetic forces between currents, magnetic induction, flux and continuity of lines of flux. Ampere's law. Ampere's law modified. Induced e.m.f. Maxwell's equations. Electromagnetic plane waves in free space.

2210 Physics II

Prerequisites: Physics I and Mathematics IA;
Corequisite: Mathematics IIA

Lectures 4 hrs per week
Tutorials/Practical 4 hrs per week

(a) Electronics and circuit theory.
(b) Thermodynamics and statistical mechanics.
(c) Atomic and nuclear physics.
(d) Relativity.
(e) Solid State Physics A.

(f) Solid State Physics B.
(g) Magnetic Materials.
(h) Electricity and Magnetism A.

2211 Physics IIA

Prerequisites: Physics I and Mathematics IA;
Corequisite: Mathematics IIA for units (h) and (i).
Lectures 2 hrs per week
Tutorials/Practical 2 hrs per week

(a) Electronics and circuit theory.
(b) Thermodynamics and statistical mechanics.

Plus a total of $1\frac{1}{2}$ points from topics (c), (d), (e), (f), (g) and (i).

2273 Physics II

Prerequisites: Physics I and Mathematics IA;
Corequisite: Mathematics IIA.
Lectures 98 hrs
Tutorials/Practical 112 hrs

SYLLABUS

The course is the same as 2210 Physics II, with the omission of the material on circuit theory.

3203 Physics III

Lectures 5 hrs per week
Laboratory 12 hrs per week

OUTLINE OF COURSE

Topics amounting to twelve points will be selected from the following list. Topics (a), (b) and (c) are compulsory. Topic (a) counts for three points, topics (b) to (d) for two points each. Each of the remainder count for one point. A student's selection will be subject to the approval of the Head of the Department.

(a) Electromagnetism and circuit theory (Prerequisite: Topic (h) of Physics II).
(b) Quantum mechanics (Prerequisite: Topic (c) of Physics II).
(c) Physics of the solid state (Prerequisite: Topics (e) and (f) of Physics II).
(d) Astrophysics.
(e) Statistical mechanics.
(f) Electron emission and applications.
(g) Electrical conduction in semi-conductors.
(h) Linear active circuits and devices.
(i) Digital circuits.
(j) Magnetic materials.
(k) Spectroscopy.
(l) Nuclear physics (Prerequisite: Topic (c) of Physics II).
(m) Particle physics (Prerequisite: Topic (c) of Physics II).
(n) Plasma physics.
(o) Ionospheric physics.
(p) Low temperature physics.

3204 Physics IIIA

Prerequisite: Physics II or Physics IIA.

Topics amounting to four points will be selected from the list appearing under Physics II and 3203 Physics III, but may not include more than one point from the former. A student's selection will be subject to the approval of the Head of the Department.

3205 Physics IIIB

Prerequisite: Physics II or Physics IIA.

Topics amounting to two points will be selected from the list appearing under Physics II and 3203 Physics III but may not include more than one point from the former. A student's selection will be subject to the approval of the Head of the Department.

1810 Physics for Arts students

Lectures/Tutorials 56 hrs

SYLLABUS

(a) A comparative study of the validity and usefulness today of theories developed by man prior to 1900, with particular reference to: the atomic theory and the structure of matter; Newtonian mechanics; electromagnetic radiation; the kinetic theory of matter. This study includes discussions of the scientific method, hypothesis and theory, and models.
(b) An introduction to the theories of the 20th century, particularly: nuclear and particle physics; special relativity and relativistic mechanics; Planck's quantum concept, wave properties of material particles.
(c) Peaceful and military applications of physics in some of the following areas: astrophysics; space research; the earth's atmosphere; nuclear energy; lasers; solar energy; plasma physics.

Department of Civil Engineering

New courses to be introduced in 1978 are based on subjects which are subdivided into teaching units. To pass a subject it is necessary to obtain a pass in aggregate, and to achieve an acceptable standard in each teaching unit. At the discretion of the Head of the Department, a student failing a unit may be required to repeat that unit.

The teaching units are multiples of sessional units consisting of twenty-seven contact hours, normally confined to the first or second half of an academic year. Thus a teaching unit which is two sessional units consists of fifty-four contact hours, which may be spread over the whole academic year.

Elective units will be selected in consultation with the Head of the Department. The full range of electives may not be available in any one year.

Outline of Course and List of Teaching Units

2726 Civil Engineering I

Name of Teaching Unit	Number of Sessional units
Concrete Technology	1
Engineering Construction	1
Geomorphology	1
Hydrology I	1
Soils Engineering I	1
Surveying I	2
Total	7

3734 Civil Engineering II

Name of Teaching Unit	Number of Sessional Units
Civil Engineering Materials	2
Coastal Engineering I	1
Hydraulics I	1
Porous Media Hydraulics	1
Soils Engineering II	2
Structural Analysis I	2
Structural Design	3
Surveying II	1
Surveying Project	1
Electives	4
Total	18

4726 Civil Engineering III

Name of Teaching Unit	Number of Sessional Units
Structural Analysis II	2
Electives	7
Total	9

List of Electives

Name of Teaching Unit	Number of Sessional Units
Applied Hydrology	1
Applied Thermodynamics	2
Civil Engineering Systems	1
Coastal Engineering II	1
Environmental aspects of Civil Engineering	1
Foundation Engineering	1
Hydraulics II	1
Hydrology II	1
Instrumentation	1
Project Management I	1
Project Management II	1
Public Health Engineering	1
Pavement Design	1
Road Design	1
Structural Analysis III	2
Surveying III	1
Water Resources	1
Approved units offered by the Department of Mathematics	2
The Operations Research III topics: simulation, inventory theory, replacement	1

Outline of Teaching Units in Civil Engineering I, II and III

(in alphabetical order)

Applied Hydrology (1 sessional unit)
Prerequisite: Hydrology I
Application of hydrology to design in urban and rural environments. Road and aerodrome drainage.

Applied Thermodynamics (2 sessional units)
Fundamental laws of thermodynamics. Thermal properties of gases and vapours. Air compressors, reciprocating internal combustion engines, other types of heat engine. Refrigeration. Thermal insulation and air-conditioning of buildings.

Civil Engineering Materials (2 sessional units)
Properties and uses of timber, structural steel, H. T. steel, special steels, structural aluminium, plastics. Failure theories. Creep and fatigue. Standard tests of mechanical properties.

Civil Engineering Systems (1 sessional unit)
Prerequisite: 3734 Civil Engineering II
Systems approach to formulation and modelling of engineering problems in design and construction. System optimisation. Decision analysis.

Coastal Engineering I (1 sessional unit)
Prerequisite: Hydrology I
Theory of periodic waves as applied to tides and wind generated waves in water of varying depths. Wave and tide prediction.

Coastal Engineering II (1 sessional unit)
Pre-requisite: Coastal Engineering I
Wave forces on structures. Shore processes and beach erosion. Estuarine hydraulics. Wave and tide models.

Concrete Technology (1 sessional unit)
Properties of hardened and plastic concrete. Mix design. Manufacturing and field control. Creep and drying shrinkage,

durability, permeability. Non-destructive testing. Concrete for special purposes.

Engineering Construction (1 sessional unit)
Role of professional construction engineer. Project breakdown into construction activities and operations. Construction equipment, materials and methods.

Environmental Aspects of Civil Engineering (1 sessional unit)
Prerequisite: 3734 Civil Engineering II
Impact of civil engineering works and decisions on the environment. Introduction to ecological concepts. Modelling of biological systems. Uncertainty in environmental systems.

Foundation Engineering (1 sessional unit)
Prerequisite: Soils Engineering II and Porous Media Hydraulics
Foundations of structures: types, basis of selection, design and analysis. Treatment of foundation soils, consolidation and allowable settlement of foundations. Design of earth and rock fill dams.

Geomorphology (1 sessional unit)
Earth's crust, vulcanism, folding, faulting, sequence. Identification of minerals and rocks. Geologic mapping, Australian series. Weathering and erosion processes; fluvial and coastal erosion. Geomorphic mapping. Terrain classification.

Hydraulics I (1 sessional unit)
Channel flow, steady non-uniform flow, backwater curves, hydraulic jump. Flow measurement. Unsteady flow, flood routing.

Hydraulics II (1 sessional unit)
Prerequisite: Hydraulics I
Hydraulic structures. Water hammer. Dimensional analysis, hydraulic model theory, scale effect. Hydraulic machinery, characteristic curves, cavitation.

Hydrology I (1 sessional unit)
Hydrologic cycle, water and energy balances, elements of meteorology; analysis of precipitation, infiltration, runoff hydrographs.

Hydrology II (1 sessional unit)
Prerequisite: Hydrology I and Hydraulics I
Physical and biological processes in the hydrologic cycle. Mathematical models. Applications to water resources analysis and management.

Instrumentation (1 sessional unit)
Measurement of physical quantities, transducers. Measuring systems, recording and transmission of data.

Pavement Design (1 sessional unit)
Thickness design of flexible and rigid pavements. Selection and use of gravels and bituminous materials. Low cost pavements. Soil stabilisation.

Porous Media Hydraulics (1 sessional unit)
Flow in saturated and unsaturated materials. Applications to consolidation theory and settlement of structures, aquifer yield and recharge, pavement design, seepage and drainage problems, and infiltration into soils.

Project Management I (1 sessional unit)
Project documents: preparation of specifications, estimates, contracts and tenders. Project finance and cost control. Project administration: Planning, scheduling and recording. Work study.

Project Management II (1 sessional unit)
Legal aspects of engineering contracts. Relationships and duties of professional agents involved in projects. Accounting. Special topics in project planning and management.

Public Health Engineering (1 sessional unit)
Prerequisite: Hydraulics I
Processes of decomposition and decay; chemical and biochemical measures of pollution. Water collection, transmission and distribution systems. Sewage collection and effluent disposal. Design of sewage treatment and water treatment processes. Swimming pools. Refuse collection and disposal.

Road Design (1 sessional unit)
Route analysis and location of rural and urban roads. Road geometrics and design. Design of horizontal and vertical curves, intersections and interchanges.

Soils Engineering I (1 sessional unit)
Soil formation, properties, classification. Compaction and CBR; engineering applications. Methods of soil survey and site investigations; geophysical techniques.

Soils Engineering II (2 sessional units)
Prerequisite: Soils Engineering I
Effective stress concept. Stress strain and pore pressure behaviour; failure criteria. Stress distribution in soils. Lateral earth pressure; retaining walls. Stability of slopes. Bearing capacity theory; shallow and pile foundations.

Structural Analysis I (2 sessional units)
Influence lines. Stability, determinacy and analysis of trusses, moment area method. Energy theorems of Castigliano, Maxwell and Betti, virtual work. Slope-deflection method. Moment distribution. Analysis of plane cable structures.

Structural Analysis II (2 sessional units)
Prerequisite: Structural Analysis I
Introduction to force and displacement methods. Limit analysis of steel structures. Stability of bars in compression. Analysis of arches, rings, and grids. Approximate analysis of statistically indeterminate structures.

Structural Analysis III (2 sessional units)
Prerequisite: Structural Analysis I
Introduction to the theory of elasticity. Introduction to the finite element method. Theory of thin plates. Experimental stress analysis.

Structural Design (3 sessional units)
Corequisite: Structural Analysis I
Types of loads on structures. Application of the SAA Loading Code, Parts 1 and 2. Design of steel, concrete and timber structures. Design of connections in steel and concrete. Simple prestressed concrete design.

Surveying I (2 sessional units)
Elementary theory of errors. Simple surveying instruments, chaining, chain surveying. Spirit levelling. Theodolites, theodolite traversing. Indirect methods of distance measurement. Tacheometry. Contour and detail surveys. Areas and volumes.

Surveying II (1 sessional unit)
Prerequisite: Surveying I
Reconnaissance survey methods. Introduction to photogrammetry. Elements of hydrographic surveying.

Surveying III (1 sessional unit)
Prerequisite: Surveying I
Introduction to geodesy and astronomy. Map projections, topographic and thematic cartography.

Surveying Project (1 sessional unit)
Prerequisite: Surveying I
A complete surveying exercise covering the establishment of horizontal and vertical control, the provision of detail information by tacheometry, and preparation of a detailed contoured plan of a suitable area.

Water Resources (1 sessional unit)
Prerequisite: Hydrology I
Methods of water resource assessment with inadequate data. Conjunctive use of surface and groundwater resources. Multi-objective design of water resource systems. Design of data collection methods.

4704C Project, Thesis and Seminar

Tutorials 140 hrs

The civil engineering project takes the form of a minor piece of research or investigation, a major feasibility study or design, or a comprehensive literature review. Emphasis is placed on application of earlier and current studies to a practical engineering problem. Where appropriate, the problem will be of a military planning nature, and may involve group effort in groundwork planning and field investigations. The project culminates in the preparation of an individual thesis.

As part of this subject, each student will be required to lead a seminar on a topic related to civil engineering.

4707 Management Science

Lectures 112 hrs
Tutorials 28 hrs

SYLLABUS

Theory of Management
The role of management in a technologically advanced society. Human behaviour in the work situation; communication; influence; decision making. Models of organisations from static structural notions to dynamic open systems. Engineering management, technical change and automation.

Engineering Economics
Basic concepts in management economics. Project evaluation techniques in private and public enterprise. Introduction to management accounting.

Operations Research
The computer science unit Operations Research II and the following topics of the computer science unit Operations Research III: Queueing Theory, Markov Chains and Network Analysis.

Department of Electrical Engineering

Electrical Engineering is much the youngest of the three major, now traditional branches of engineering. It had its origin in the turning to practical use of the discoveries of Faraday, Ampere, Maxwell and a number of other eminent 19th century physicists. It has remained the most strongly science-oriented branch of engineering.

At first it had its major impact by providing the means for the generation, distribution and utilisation of electric power. However, while this remains an important sub-area of the whole subject, the last three decades particularly have seen a rapid and extensive diversification into the fields of computers and control and electronics and communications, and beyond them into such areas as biology and medicine. The methodology invented by electrical engineers to conceptualise their problems has been widely borrowed to become an important part of the philosophic underpinnings of other diverse fields which, on the surface at least, have seemingly little in common with electrical engineering.

It is now true to say that there are very few areas of civilised activity which have remained untouched by the ideas and products of modern electrical technology. The absorption of recent scientific development has been very rapid and has demanded a fully developed scientific outlook on the part of electrical engineers for a proper understanding of the problems involved. Many devices, scarcely more than laboratory prototypes a decade ago, are now in widespread use as fully engineered hardware.

The course in electrical engineering leading to the BE degree which is offered at the Royal Military College provides for study and, at the final year level, some degree of specialisation in each of the three major subdivisions of electrical engineering—power and energy conversion, electronics and communications, and computers and control. It is intended to be systems oriented and topics included are selected with the vocational nature of the College in mind but their development is not otherwise especially militarily oriented. The course is designed to provide a sound base in science and mathematics as well as a properly developed grasp of electrical engineering principles. The first year is common with the other branches of engineering and is devoted mainly to the development of the scientific and mathematical foundations. Students are encouraged to look outside their chosen specialisation by inclusion of a general studies requirement and the third year of the course includes a strong component in management science and operations research which is common with the other engineering streams.

A major course revision was undertaken during 1975. This has led to a regrouping of subject material, the introduction of new topics and a rearrangement of the courses. To facilitate the latter and to increase program flexibility the concept of 'sessional units' has been introduced. A sessional unit comprises two contact hours per week for fourteen weeks, that is for half of the weeks programmed for academic work in a year. Thus a sessional unit consists of twenty-eight contact hours and will normally be confined to either the first or the second half of a year. The first half of a year is denoted 'session one' and the second half 'session two'. In some cases a unit may be presented during either session of a year, but in other cases one unit may be a prerequisite for another, so that the former unit would be presented in session one and the latter unit in session two. The new courses were presented for the first time in 1976.

Outline of Course and List of Sessional Units

2746 Electrical Engineering I

Students taking this subject will do all six sessional units listed below. To pass the course a pass in aggregate must be obtained.

Unit No.	*Unit Name*	*Session*
1	Electronic Devices	1
2	Electrical Measurements	1
3	Introductory Circuit Theory, Part 1	1
4	Introductory Circuit Theory, Part 2	2
5	Electronic Circuits	2
6	Machines and Transformers	2

3748 Electrical Engineering II

Students taking this subject will do all twelve sessional units listed below. To pass the course a pass in aggregate must be obtained.

Unit No.	*Unit Name*	*Session*
1	Intermediate Circuit Theory	1
2	Electrical Properties of Materials	1
3	Introductory Digital Systems, Part 1	1
4	Introductory Digital Systems, Part 2	2
5	Classical Linear Systems	2
6	Fundamentals of Analogue Computation	2
7	Engineering Electromagnetics	2
8	Electronic Device Theory	2
9	Power and Machines	Optional
10	Intermediate Electronic Circuits	Optional
11	Signals and Information Theory	Optional
12	Industrial Electronics	Optional

4742 Electrical Engineering III

Students taking this subject will normally select 16 sessional units from those listed below. As an alternative, courses to the equivalent of four sessional units may, with the approval of the appropriate Heads of Departments, be selected from offerings in other departments and the remainder to a total of 16 from the list below. To pass the course a pass in aggregate must be obtained.

Unit No.	*Unit Name*	*Session**	*Preq. Unit*
1	Maser and Laser Theory	1	..
2	Mathematics of Communications Theory	1	..
3	Feedback Control Theory	1	..
4	Advanced Digital Systems	1	..
5	Field Theory of Guided Waves	1	..
6	Antennas and Radiation	1	..
7	Advanced Electronic Materials	1	..
8	Laser Applications	2	1
9	Statistical Theory of Communications	2	2
10	Space Communications	2	2
11	Military Electronics	2	2
12	Theory of Optimal Control	2	3
13	Computer Control	2	3
14	Introduction to Non-Linear Systems	2	3
15	Advanced Computer Architecture	2	4
16	Active Microwave Devices	2	5
17	Microwave Optics	2	6
18	Opto-Electronic Devices	Optional	..
19	Transistor and Integrated Circuit Technology	Optional	..

20	Elements of Radiowave Propagation	Optional	
21	Advanced Circuit Theory	Optional	
22	Network Synthesis	Optional	
23	Advanced Electrical Machines	Optional	
24	Power Systems	Optional	
25	General Theory of Electrical Machines	Optional	
26	Illumination Engineering	Optional	
27	Engineering Magnetohydrodynamics	Optional	
28	Electrical Energy Conversion	Optional	
29	Power Electronics	Optional	
30	Fundamentals of Simulation	Optional	
31	State Variable Methods	Optional	
32	Television Systems	Optional	
33	Principles of Radar	Optional	
34	Reliability Analysis	Optional	
35	Communications Electronics	Optional	

* A course listed as a first session course may be given in the second session if no student elects to take an option for which it is a prerequisite

2746 Electrical Engineering I

Electronic Devices (Unit 1)

Lectures/Tutorials 16 hrs
Laboratory 12 hrs

A first course in vacuum and solid state electronic devices.
Electron emission; electron ballistics; principles of operation of vacuum tubes and cathode-ray tubes.
Conduction in solids; semiconductors, electrons and holes, doping, energy bands. Physical principles of a p-n junction; characteristics of semiconductor diodes and transistors.

Electrical Measurements (Unit 2)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

An introductory course in the theory and practice of electrical measurements. Measurement errors and their calculations. Electrical indicating instruments. Electronic instruments. Instrumentation transducers. Instrumentation systems.

Introductory Circuit Theory, Part 1 (Unit 3)

Lectures/Tutorials 28 hrs

A first course in circuit theory with emphasis on network topology. Network as a system; model concept; meanings of lumped, linear, passive, bilateral, time invariant. Network topology; graphs and trees; mappability; loop currents and tie sets; node pair voltages and cut sets; duality. Derivation of the equilibrium equations; Kirchhoff's laws; simplified procedures: sources. Solution of the equilibrium equations. Thevenin's and Norton's theorems; reciprocity, driving point and transfer impedances; network transformations; power relations.

Introductory Circuit Theory, Part 2 (Unit 4)

Lectures/Tutorials 28 hrs

A first course in circuit theory with time varying excitation. Resistance, capacitance and self inductance as circuit elements; equilibrium equations in integro-differential form; step, impulse and higher order singularity functions; classical solution of the equilibrium equations; impulse response and convolution; solution of equilibrium equations by integral transform methods; time harmonic, steady state, complex notation, phasors and impedance, RMS values, real and reactive power, resonance, mutual inductance, ideal transformer.

Electronic Circuits (Unit 5)

Lectures/Tutorials 16 hrs
Laboratory 12 hrs

An introduction to the theory and practice of simple electronic circuits.
Rectification, filtering and regulation. Introduction to audio frequency amplifiers, hybrid parameters, biasing, frequency response, negative feedback. Operational amplifiers.

Machines and Transformers (Unit 6)

Lectures/Tutorials 20 hrs
Laboratory 8 hrs

An introduction to DC and AC machines and related topics. Magnetic fields and circuits; electrical, mechanical and magnetic interaction; machines as energy conversion devices. DC machines; commutation; generators and motors; steady-state operation. Power systems; single and poly-phase alternating currents. Single-phase transformers; construction and steady-state operation. AC machines; rotating magnetic fields; types of generators and motors; elementary consideration of synchronous generators.

3748 Electrical Engineering II

Intermediate Circuit Theory (Unit 1)

Lectures/Tutorials 28 hrs

A further development of topics in circuit theory. Transient response of linear circuits. Branch parameter matrices; use of tie set and cut set matrices in establishing equilibrium equations on a loop or node basis. Energy functions. Image parameter filter theory; magnitude and frequency scaling. Distributed parameter theory of transmission lines; special cases of RF lines; Smith chart. Mechanical, other non-electrical circuits and mixed circuits.

Electrical Properties of Materials (Unit 2)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Classification of solids. Bond types; the electron as a particle and as a wave: wave mechanics of electrons. Band theory of solids; density of states. Boltzmann and Fermi-Dirac distributions: Fermi level in solids; effective mass. Intrinsic and extrinsic semi-conductors. Hall effect.

Introductory Digital Systems, Part 1 (Unit 3)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

The following topics of the Computer Science unit Digital Systems II:
Introduction to the basic concepts in the design of digital systems with the emphasis on logical aspects: Boolean algebra; methods for the logical synthesis of switching networks, both combinational and sequential.

Introductory Digital Systems, Part 2 (Unit 4)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

The following topics of the Computer Science unit Digital Systems II:
Utilisation of electronic devices as bivalued elements in digital systems. Introduction to computer organisation.

Classical Linear Systems (Unit 5)

Lectures/Tutorials 28 hrs

A first course on system theory emphasising the viewpoints and techniques of the electrical engineer.Concept of a system. Open loop and closed loop systems; basic concepts of feedback. Time domain response of second order systems; proportional, derivative and integral control; over, under and critical damping; speed of response; root trajectories in the complex plans; frequency response. Transfer function analysis; derivation of typical transfer functions. Reduction of block diagrams. Nyquist diagrams and Bode plots. Routh and Nyquist criteria for stability. Signal flow graphs.

Fundamentals of Analogue Computation (Unit 6)

Lectures/Tutorials 16 hrs
Laboratory 12 hrs

Analogue computer components and their organisation into a computer system. Programming, setting up and scaling of problems on an analogue computer.

Engineering Electromagnetics (Unit 7)

Lectures/Tutorials 22 hrs
Laboratory 6 hrs

A discussion of time varying electric and magnetic fields with some elementary applications. Induction; Maxwell-Faraday law, self and mutual inductance. Displacement current; Maxwell-Ampere law. Time harmonic Maxwell equations; potentials; Poynting vector. Dielectric hysteresis; boundary conditions. Relation between field and circuit theory. Plane waves in dielectric and conducting materials; phase and group velocity, refractive index, dielectric impedance. Skin effect, relaxation time, reflection at a plane boundary, standing waves. Field theory of TEM mode line, electromagnetic radiation.

Electronic Device Theory (Unit 8)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Quantitative theory of p-n junction. Surfaces and metal semiconductor contacts. Principles of semiconductor devices, junction transistor, power transistor, thyristor, field effect transistor and various types of diodes.

Power and Machines (Unit 9)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Basic machine windings. Further consideration of synchronous and asynchronous AC machines under steady-state conditions. Poly-phase transformers. Two-three phase transformation. Parallel operation of machines. Metadynes and other machines used in control systems. Introduction to transient operation of machines. Power system measurements and instrumentation.

Intermediate Electronic Circuits (Unit 10)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Small signal amplifiers, wide band, direct-coupled, tuned. Power amplifiers, classes A, B and C. Osciilators.

Signals and Information Theory (Unit 11)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Characteristics of signals. Noise. Information content of signals. Modulation techniques. Demodulation.

Industrial Electronics (Unit 12)

Lectures/Tutorials 20 hrs
Laboratory 8 hrs

Power diodes, transistors and controlled rectifiers: characteristics, ratings, cooling and protection. Rectifying circuits; regulated power supplies. Controlled rectifiers: firing circuits using discrete components, commutation in AC and DC circuits with resistive loads. Choppers and inverters. Transducers. Industrial and commercial systems for control of temperature, speed, liquid level or other parameters. No-break power supplies. Feedback. Harmonics: analysis, minimisation and passive filters.

4742 Electrical Engineering III

Masers and Laser Theory (Unit 1)

Lectures/Tutorials 28 hrs

Properties of light and coherent radiation. Stimulated and spontaneous emission, population inversion, threshold conditions for amplifiers and oscillators. Homogeneous and inhomogeneous line broadening. Principles of operation and applications of the cavity maser and the travelling wave maser. Noise in maser devices.

Mathematics of Communications Theory (Unit 2)

Lectures/Tutorials 28 hrs

Periodic signals and Fourier series. Aperiodic signals and Fourier transforms. Convolution and impulses. Correlation and spectral density. Random variables and probability functions. Probability models. Random signals and noise.

Feedback Control Theory (Unit 3)

Lectures/Tutorials 16 hrs
Laboratory 12 hrs

Introduction to the basic theoretical tools for the analysis and design of feedback control systems. Theory of dynamic systems, phase-space approach. Stability theory, Nyquist criterion.

Advanced Digital Systems (Unit 4)

Lectures/Tutorials 16 hrs
Laboratory 12 hrs

The following topics of the Computer Science unit Digital Systems III:
Implementation of computer logic. Hardware elements and algorithms. Control functions. Input-output facilities.

Field Theory of Guided Waves (Unit 5)

Lectures/Tutorials 22 hrs
Laboratory 6 hrs

A course on the theory of transmission lines, waveguides and associated devices. Microwave frequencies and uses. Review of Maxwell's equations, constitutive relations, boundary conditions, potential theory. Lorentz reciprocity theorem. Basic field theory of TEM lines, rectangular and circular waveguides. Circuit theory of wave guiding systems, wave normalisation, equivalent voltages and currents, impedance, wave matrices. Impedance transformation and matching. Theory of selected passive microwave devices. Microwave ferrites. Resonators. Periodic structures and filters.

Antennas and Radiation (Unit 6)

Lectures/Tutorials 22 hrs
Laboratory 6 hrs

Small antennas. Arrays. Wire antennas. Aperture antennas. Wide-band antennas. Receiving antennas. Antenna measurements.

Advanced Electronic Materials (Unit 7)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Principles and applications of dielectric, ferro-electric, piezo-electric and thermoelectric effects in bulk and thin film materials. Electron transport phenomena in a magnetic field, Hall effect, magneto resistance, thermomagnetic effect.

Laser Applications (Unit 8)

Lectures/Tutorials 16 hrs
Laboratory 12 hrs

Design and principles of operation of gas, solid state and semi conductor lasers. Applications in information transmission and metrology. Applications involving laser power. Laser safety. Laser holography, types of holograms and their application for non-destructive testing and information storage.

Statistical Theory of Communications (Unit 9)

Lectures/Tutorials 20 hrs
Laboratory 8 hrs

Elements of a communications system. Probabilistic formulation of the communications problem. Base band analogue and digital transmission. Signal to noise ratio and threshold effects in linear and exponential modulation systems. Sampling theory and pulse modulation. Information theory and communications systems. Digital data systems.

Space Communications (Unit 10)

Lectures/Tutorials 28 hrs

A study of space communication systems, long distance transmission, wave propagation and system considerations.

Military Electronics (Unit 11)

Lectures/Tutorials 22 hrs
Laboratory 6 hrs

Principles of electronic countermeasures and counter countermeasures. Jamming techniques, recovery of signals in a countermeasures environment. Adaptive systems. Application to radar and communications systems.

Theory of Optimal Control (Unit 12)

Lectures/Tutorials 28 hrs

The optimal control problem. The maximum principle of Pontryagin. Hamilton-Jacobi equation. Canonical equations. Minimum time, fuel and energy problems. Design of optimal and sub-optimal systems.

Computer Control (Unit 13)

Lectures/Tutorials 22 hrs
Laboratory 6 hrs

The principles of plant modelling, parameter estimation and optimal control in the computer control of complex processes. The mathematical representation of physical processes. Analogue, digital and hybrid simulation of physical processes.

Introduction to Non-Linear Systems (Unit 14)

Lectures/Tutorials 28 hrs

Study of non-linear systems and methods of analysis. Stability studies with Lyapunov functions and functional analysis. Applications from electric circuits and control systems.

Advanced Computer Architecture (Unit 15)

Lectures/Tutorials 22 hrs
Laboratory 6 hrs

The following topics of the Computer Science unit Digital Systems III:
Advanced addressing principles, memory paging, segmentation and protection techniques. Microprogramming. Multiprocessors, high speed and pipeline systems. Computer system reliability.

Active Microwave Devices (Unit 16)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

R W H mechanism, Gunn oscillator, microwave semiconductor devices. Microwave valves, travelling wave tube, klystron and magnetron.

Microwave Optics (Unit 17)

Lectures/Tutorials 22 hrs
Laboratory 6 hrs

Asymptotic methods. Asymptotic solution of Maxwell's equations. Geometrical optics. Geometrical theory of diffraction. Diffraction by an edge. Diffraction by a curved surface. Aperture radiation. Fields at axial caustics.

Opto-Electronic Devices (Unit 18)

Lectures/Tutorials 22 hrs
Laboratory 6 hrs

Photoconductive and photoelectric processes, electroluminescence. Visual display systems, image intensifiers, infra-red imaging devices, liquid crystal displays.

Transistor and Integrated Circuit Technology (Unit 19)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

An introduction to planar technology of semiconductor devices and integrated circuit fabrication. Thin film microelectronics and thick film circuits.

Elements of Radiowave Propagation (Unit 20)

Lectures/Tutorials 22 hrs
Laboratory 6 hrs

Ground wave propagation. Plane-earth reflection. Space wave and surface wave. Spherical earth propagation. Tropospheric wave. Ionospheric propagation. Reflection and refraction of waves by the ionosphere. Skywave transmission calculations. Effect on the earth's magnetic field. Wave propagation in the ionosphere.

Advanced Circuit Theory (Unit 21)

Lectures/Tutorials 28 hrs

A course intended to more extensively develop material presented in earlier courses. Topics will be selected from: computer aided design; insertion loss design methods; active filter design; Fourier integral, convolution and their interrelation; Tellegen's theorem with application; tolerance theory in circuit design; treatment of non-linearities by small signal and piecewise continuous techniques; energy functions, equivalence of Kirchhoff and Lagrange equations, relation to impedance functions.

Network Synthesis (Unit 22)

Lectures/Tutorials 28 hrs

The synthesis problem, approximation and realisation. Properties of passive one ports; positive real functions. One port realisation techniques. Properties of two ports; impedance and admittance matrices. Transfer function realisation. RC ladder and terminated LC structures. Introduction to the approximation problem.

Advanced Electrical Machines (Unit 23)

Lectures/Tutorials 20 hrs
Laboratory 8 hrs

Introduction to generalised theory of electrical machines. Control of speed, frequency and voltage. Induction machines, synchronous machines, DC machines and transformers. AC commutator motors. Operation of machines under transient conditions. Protection. Faults. Locus diagrams. Limits of stability. Hunting.

Power Systems (Unit 24)

Lectures/Tutorials 22 hrs
Laboratory 6 hrs

The nature, extent and variety of power systems. Components of power systems and their characteristics. Generators, transmission lines, transformers and loads. Control of power systems. Frequency, voltage, power, VAR. Load flow analysis. Simple networks. Use of computers in large systems. Faults on systems. Symmetrical components. Balanced and unbalanced faults. Stability of power systems. Steady-state and transient stability. DC transmission.

General Theory of Electrical Machines (Unit 25)

Lectures/Tutorials 28 hrs

Maxwell's equations and the Lorentz transformation. The idealised electrical machine. Two-axis theory. Kron's primitive machine. Voltage and torque equations. Equations of motion. General equations in matrix form. Linear transformations. Invariance of power. Formulation of generalised equations for transformers and rotating machines. Operation of machines under steady-state and transient conditions.

Illumination Engineering (Unit 26)

Lectures/Tutorials 20 hrs
Laboratory 8 hrs

The nature of light and the characteristics of the eye as related to lighting and seeing. Commercial methods for production of light including incandescence, luminescence, fluorescence and gaseous sources. Characteristics of light sources and associated circuitry. Illumination measurements. Prescribed standards of illumination. Psychological and other factors affecting design of lighting systems. Typical designs and calculations.

Engineering Magnetohydrodynamics (Unit 27)

Lectures/Tutorials 28 hrs

The MHD approximation. Motion of charged particles. Statistical behaviour of plasmas. Conduction and diffusion. Electro-magnetic waves and radiation in plasmas. MHD equations. Alfven and shock waves. Channel flows. Boundary layers. MHD propulsion. MHD power generation.

Electrical Energy Conversion (Unit 28)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Energy supplies, efficiency of conversion, entropy. Sources: nuclear, chemical, solar. Magnetohydrodynamic conversion. Electromechanical conversion. Fuel cells. Solar cells. Thermoelectric converters. Thermionic converters.

Power Electronics (Unit 29)

Lectures/Tutorials 20 hrs
Laboratory 8 hrs

Series and parallel connection of semiconductors used in power circuits. Further discussion of firing circuits for controlled rectifiers. Integrated-circuit devices. Effects of load power-factor. Control of frequency and voltage as applied to the control of electrical machines. Regulators, inverters, cycloconverters. Closed loop systems. Thyristor assisted commutation. High-voltage DC power transmission. Magnetic amplifiers.

Fundamentals of Simulation (Unit 30)

Lectures/Tutorials 16 hrs
Laboratory 12 hrs

The basic methodology of simulation and its relationship to operations research. Analogue, digital and hybrid simulation. Design of simulation experiments. Solution and simulation of models to predict system response and behaviour.

State Variable Methods (Unit 31)

Lectures/Tutorials 28 hrs

Elements of linear transformation and matrix theory. State equations and vectors. Differential time-invariant and time-variable systems. Discrete systems. Observability and Lyapunov stability.

Television Systems (Unit 32)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Physiological aspects of television, television standards, colour systems with particular reference to the PAL system, transmitters and receivers. Facsimile.

Principles of Radar (Unit 33)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Antennas for radar. Target characteristics. C-W radar. Pulsed-Doppler radar. Types of radar. Reception and noise. Propagation. Radar system design. Radar testing.

Reliability Analysis (Unit 34)

Lectures/Tutorials 28 hrs

Principles of reliability analysis. Review of basic mathematical and statistical tools. Catastrophic failures; exponential and Wiebull distributions; component and system failure models. Marginal failures; tolerances and environmental drifts. Redundancy techniques. Repairable systems. Statistical design of tests; failure rates, reliability specifications.

Communications Electronics (Unit 35)

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

A selection from the following topics to accommodate the interests of the class: multistage amplifiers; noise in amplifiers; linear integrated circuits; amplifier compensation; active filters; large-signal tuned amplifiers; switching and pulse circuits; digital integrated circuits.

3750 Electrical Technology

Circuit Theory and Machines

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Basic DC and AC circuit theory. Transformers and electrical machines with applications.

Basic Electronics

Lectures/Tutorials 19 hrs
Laboratory 9 hrs

Elementary electronic components, devices and circuits.

4703E Project, Thesis and Specialist Lectures

140 hrs

The project will take the form of a minor piece of research or investigation, a feasibility study or design, or a comprehensive literature review chosen from a list of topics selected or approved by the Head of Department. As far as possible these topics will be of a military nature. Group effort may be permitted in appropriate cases.

In each case a staff member will be nominated as a supervisor to provide guidance and general supervision during the preparation of the thesis. Evidence of sufficient progress may be required from time to time. The thesis, which will be of not less than 5000 words, will be presented in draft in the prescribed format not later than the last day of the teaching year. Arrangements will be made for theses of outstanding merit to be typed, bound and deposited in the departmental library.

During the year students taking this subject will be required to participate in a series of seminars. In the first half of the year these will take the form of a series of about twelve specialist lectures on selected topics which will be presented by invited lecturers who are well known in a particular field of study or who are practising engineers in some field of engineering. There will be no formal examination in this part of the subject but students will be assessed on the basis of their participation and on short written summary reports on the lectures.

Department of Mechanical Engineering

1708 Engineering I

Lectures 66 hrs
Drawing Office 50 hrs
Shop Work 50 hrs
Laboratory/Tutorials 40 hrs

SYLLABUS

Introduction to Technology
The present day scope of engineering viewed against its historical background especially in Australia.

The production in Australia of iron, steel and the common non-ferrous metals. Definitions and measurements of properties of materials.
The principles of pattern-making, foundry work, metal machining, workshop measurement and gauging.

Engineering Mechanics
Statics of particles and rigid bodies under two- and three-dimensional force systems. Applications to trusses, frames and machines. Dry friction, wrapping friction. Distributed forces: centre of gravity and centroid of geometric figures. Internal forces in structural members: shear and bending moment diagrams. Principle of virtual work, application to statics of machines. Moments of inertia. Cables and catenaries.

Kinematics and kinetics of the plane motion of a particle and a rigid body. Equations of motion: work, energy, impulse, momentum.

Drawing Office
Drawing as a means of communicating information accurately; sketches from machine parts and models. An introduction to the design process, to case studies and to the principles of drawing office practice.

Workshop Practice
Instruction and practice in the use of hand and machine tools. The production of simple machine parts from drawings supplied.

2718 Engineering II

Lectures 118 hrs
Laboratory/Tutorials 50 hrs

SYLLABUS

Mechanics of Solids
Analysis of forces in simple trusses, frames and machines. Shearing force and bending moment diagrams for straight beams. Graphic statics.

Elastic stress and strain due to tension, compression, shear, and torsion; elastic constants.
Statically indeterminate problems; temperature stresses, lack of fit, biaxial stress; Mohr's circle, principal stresses, complementary stresses.
Statical determinacy and indeterminacy—internal and external.
Flexure and shear stress in beams. Torsion of solid and hollow circular shafts. Axially and eccentrically loaded 'short' and 'long' columns; Euler theory.
Deflection of statically determinate beams.

Materials I
Materials science. Structure of perfect and imperfect solids. Phase equilibria in one and multicomponent systems. Grain structure, effect of deformation, recrystallisation, hot and cold working. Non-equilibrium relationships in multiphase materials; applications to heat treatment. Behaviour of materials in service: deformation, fatigue, fracture, wear, thermal stress, creep, radiation damage. Effects of microstructure and macrostructure on properties. Materials in electric and magnetic fields. Introduction to ceramic phases and properties. Organic phases; physical properties, applications, elastomers, insulators, adhesives. Metal removal, surface finishing, joining.

Fluid Mechanics
Physical properties of fluids, fluid statics. Continuity, one-dimensional energy and momentum equations. Laminar and turbulent flow, Reynolds number, pipe flow. Introduction to hydraulic machines. Boundary layer theory. Lift and drag.

2768 Mechanical Engineering I

Lectures 84 hrs
Drawing Office/Laboratory 112 hrs

SYLLABUS

Thermodynamics I
Fundamental laws of thermodynamics.
Thermodynamic properties of fluids.
Reciprocating engines and compressors: cycle analysis, construction, performance.

Mechanics of Machines I
Plane motion of a rigid body—translation and rotation. Equations of motion.
Kinematics of simple link mechanisms. Inertial loads. Methods of determining the velocity and acceleration of link members. Flywheels, crank-effort diagrams. Fluctuation of energy and angular velocity.
Simple vibration problems.
Geared systems. Balancing of rotating masses.

Design I
The general principles of design. The influence of manufacturing processes on design. Thread forms and standards. Strength of bolts. Limits and fits. Stress concentrations. Sliding bearings. ball and roller bearings. Keys, couplings, clutches and brakes. Flat and vee belt drives. Wire ropes and conveying equipment. Thin cylinders. Tension, compression and torsion springs. Welded and bolted connections. Design of structural elements.

Drawing Office Practice
Design of simple elements for machines and structures.

3761 Applied Thermodynamics

Lectures 28 hrs
Tutorials/Practical 28 hrs

SYLLABUS

Fundamental laws of thermodynamics. Thermal properties of gases and vapours. Air compressors. Reciprocating internal combustion engines. Other types of heat engines. Refrigeration. Air-conditioning of buildings.

3774 Mechanical Engineering II

Lectures 231 hrs
Tutorials 80 hrs
Laboratory 123 hrs

SYLLABUS

Thermodynamics II
Vapour power cycles. Gas power cycles. Heat pump and refrigeration cycles. Combustion processes. Properties of mixtures. Air conditioning.

Fluid Dynamics I
Dimensional analysis. Similitude and modelling. Fields. Mass and momentum equations. Vorticity. Deformation, dilation. Existence conditions for stream and potential functions. One-dimensional gas dynamics.

Dynamics I
Mechanisms. Instantaneous centres and vector velocity diagrams. Inertia torque. Balancing of rotating and reciprocating masses. Free and forced vibration of single degree of freedom, undamped and damped systems. Introduction to film and boundary lubrication.

Stress Analysis
Equations of two-dimensional theory of elasticity. Experimental methods of stress and strain analysis.

Materials II
Further study of materials science. Ferrous and non-ferrous materials. Ceramics. Plastics.

Control Theory I
System components, transfer functions, open and closed loop systems, transients and frequency response. Second order system with modification of system parameters. Introduction to stability criterion.

Principles of Instrumentation
Measuring systems and techniques, measurements of physical quantities, recording and transmission of data.

Design II
Analysis and design of mechanical components. Design of rotating and reciprocating machinery. Gear design. Pressure vessels. Limits and fits. Geometric analysis.

4764 Mechanical Engineering III

Lectures/Laboratory/Tutorials 252 hrs

SYLLABUS

Mechanical Engineering III will consist of Dynamics II, Thermodynamics III and Mechanics of Solids II, plus a selection of three topics from the elective list, as approved by the Head of the Department.

Dynamics II
Mechanical vibration: two, three and multi-degree of freedom systems; natural modes, forced vibrations. Whirling of shafts with many degrees of freedom.

Thermodynamics III
Conductive heat transfer under steady and unsteady conditions, convective and radiant heat transfer.

Mechanics of Solids II
Applied elasticity: plates, rotating discs, contact stresses. Theory of plasticity. Slip line field theory, velocity fields, stress fields, upper and lower bounds.

Elective Topics
Mechanics of Solids III
Elastic stability: buckling of thin rings, tubes, shells and plates, twist bend buckling.
Inelastic response: non-linear response of materials, analysis of structural elements, pressure vessels.
Applied plasticity: analysis of forming and machining processes.

Fluid Dynamics II
Cartesian tensors. Compressible flows. Navier-Stokes and energy equations. Turbulent motion, Reynolds stresses. Boundary layer theory. Forced convection in laminar and turbulent flows. Free convection. Diffusion. Mass transfer. Radial flow and axial flow turbomachinery. Design considerations. Cavitation. Matching of component characteristics.

Thermodynamics IV
Selected topics in classical and statistical thermodynamics theory. Selected applications.

Control Theory II
Response functions. The general criterion for stability. Routh's criterion. Electronic analogue computer and its use in system simulation. Nyquist criterion and Nyquist diagrams. Bode diagrams and frequency response analysis. Root locus methods. Types of controller action and their effects on system response. Optimum settings, ultimate period method and maximum gain method. Analysis of types of pneumatic controllers and other control system components. Application of automatic control of typical mechanical systems.

Design III
Interchangeable manufacture; standardisation; unit and selective assembly; preferred sizes. Presentation and interpretation of geometric tolerances; grouping analysis of non-linear loop equations, economic allocation of tolerances; application of probability theory to tolerance allocation. Gauge design—effect of gauge tolerances on interchangeability.

Dynamics III
Advanced kinematics, velocity and acceleration analysis of complex mechanisms. Inflection circle. Euler-Savary equations.
Dynamic motion analysis, energy distribution, rate of change of energy methods.
Disc cams, analysis, synthesis, follower offset, spring determination.
Advanced dynamics, velocities and accelerations in three-dimensional co-ordinate systems. Moving frames of reference. Lagrange's equations. Euler's equations of motion.

4073M Project and Thesis

140 hrs

The project will take the form of a minor piece of research or investigation, a major feasibility study or design, or a comprehensive literature review.

The Engineering group of departments

1808 Engineering and Society

Lectures/Tutorials 56 hrs

SYLLABUS

(a) *Core Course*
Topic
(1) Historical perspectives: Development of communications, power transportation, Scope of modern engineering
(2) Engineering approach to problem solving: Systems engineering, Mathematical models, Optimisation, Simulation
(3) Engineering approach to design: Identification, Creativity, Computer methods
(4) Engineering aspects of management: Methods engineering, Work study, Human engineering
(5) Engineering approach to resources: Planning, Allocation, Management of non-renewable resources
(6) Engineering and Society: Consequences of engineering, Environment, Potential of technology for sustaining life styles

(b) *Case Studies*
Approximately two studies to be considered in any one year. The list would be topical and would depend upon the interests of available staff. Typical subjects might be: Electric cars; Water recycling; Atmospheric pollution; Urban freeways; Alternative technologies; Nuclear power generation.

Four or five hours to be devoted to each study. For effective presentation the class will be divided into syndicates.

Postgraduate Study

Opportunities exist in the Faculty for postgraduate study and research leading to the University's degrees of Master of Arts (Honours), Master of Science, Master of Engineering and Doctor of Philosophy. It is likely that from 1979 candidates also may register for the Master of Engineering Science in the Faculty of Military Studies. Postgraduate registration is not restricted to military students.

Inquiries should be directed in the first instance to the heads of the appropriate departments.

The conditions for the award of higher degrees are specified in the current Sciences, Engineering and Arts Faculty Handbooks of the University. Intending registrants are advised also to consult with the Registrar of the College before applying for admission to candidature in the Faculty.

The conditions for the award of the degree of Master of Engineering Science in the Faculty of Military Studies, being peculiar to the Faculty, are specified below.

Conditions for the award of the degree of Master of Engineering Science in the Faculty of Military Studies

1. The Degree of Master of Engineering Science in the Faculty of Military Studies may be awarded by the Council on the recommendation of the Professorial Board to a candidate who has satisfactorily completed a program of advanced study comprising formal course work including as prescribed the submission of a report on a project or design approved by the Higher Degree Committee of the Faculty of Military Studies hereinafter referred to as the Committee.

2. *Qualifications for Registration as a Candidate for the Degree:*

(i) An applicant for registration for the degree shall be a graduate from an appropriate four-year full-time undergraduate course in this University or other approved university or tertiary institution at a level approved by the Committee.

(ii) The Committee may consider applications from graduates of three-year full-time courses in this University or other approved university or tertiary institution who also submit evidence of attainment in appropriate postgraduate activities extending over a period of not less than one full-time year or its equivalent.

(iii) In special circumstances an application may be accepted from a person who submits evidence of such academic and professional attainments as may be approved by the Committee.

(iv) Notwithstanding any other provisions of these conditions the Committee may require an applicant to demonstrate fitness for registration by carrying out such work and sitting for such examinations as the Committee may determine.

3. *Registration:*

(i) An application to register as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least three (3) calendar months before commencement of the course. The Committee shall determine the date of registration. In special circumstances and on the recommendation of a Head of Department registration may be permitted up to one calendar month prior to commencement of the course.

(ii) An applicant for registration shall indicate the proposed project or design area in order that responsibility for the supervision of the program may be determined.

(iii) A candidate for the degree shall be required to undertake such course of formal study, pass such examinations and submit a report on a project or design as prescribed by the Committee. Except in exceptional circumstances a candidate shall be required to pass at the first attempt all examinations prescribed by the Committee.

(iv) No candidate shall be considered for the award of the degree until the lapse of two sessions in the case of a full-time candidate or four sessions in the case of a part-time candidate from the date of registration. In exceptional circumstances the Committee may approve remission of up to two sessions for a part-time candidate.

(v) The progress of a candidate shall be reviewed at least once annually by the Committee on the recommendation of the Head of Department in which the candidate is registered and as a result of such review the Committee may terminate candidature.

4. *Program of Advanced Study:*

The program of advanced study including the preparation of a report on a project or design to be completed by each candidate shall total at least 36 credits, the number of credits allocated for each subject being determined by the Committee on the recommendation of a Head of Department.

5. *Project or Design:*

(i) Where specified, a report on a project or design approved by the Committee may be submitted at, or before, the completion of the formal section of the course, but unless exceptional circumstances prevail shall be submitted not later than one year after completion of such course.

(ii) The format of the report shall accord with the instructions of the Department and shall comply with the requirements of the Committee for the submission of project reports.

(iii) The report shall be examined by two examiners appointed by the Committee.

(iv) After examining the report on the project or design an examiner may:

(a) advise that the report reaches a satisfactory standard; or

(b) recommend that the candidate be required to resubmit the report in revised form after further work; or

(c) advise that the report has not reached a satisfactory standard.

(v) A candidate may be required to attend for an oral or written examination.

6. *Recommendation for Admission to Degree:*
The Committee, after considering the examiners' report, where appropriate, and the candidate's other work in the prescribed course of study, shall recommend to the Professorial Board whether or not the candidate be admitted to the degree.

7. *Fees*
An approved candidate shall pay such fees as may be determined from time to time by the Council.

Courses for the Degree of M.Eng.Sc. in Electrical Engineering

All study course units prescribed below will be composed of a total of 28 hours of 1 hour lecture, tutorial or laboratory sessions given at the rate of two per week over a 14 week period. In this respect they are the same as the sessional unit modules currently used in the undergraduate course given in electrical engineering. Each study course unit will contribute a total of two credits toward the degree. Not all course units will be available each time that the course is presented. Some of these courses will be given by departments other than the Department of Electrical Engineering and where appropriate this is indicated in the course unit prescription.

As prescribed by the degree rules there will also be a design or project requirement. This will contribute 12 of the required total of 36 points toward the degree.

Students enrolling for this degree will be at least ordinary degree graduates from an appropriate four year engineering degree course or have qualifications which are judged by the Higher Degree Committee to be equivalent. In the case of students wishing to enrol for the M.Eng.Sc. degree course specialising in Electrical Engineering an appropriate first degree will be one in electrical engineering. For a number of the subjects prescribed this is a sufficient prerequisite but in certain cases intending candidates will be required to demonstrate that in their undergraduate work they have undertaken appropriate prerequisite studies or that they have reached this standard as a result of a subsequent industrial experience*. Where this is the case it is indicated.

Students not possessing the necessary background will be recommended to attend a qualifying course before undertaking more advanced studies.

Course unit prescriptions have been devised so that courses may be presented and taken in any order by students possessing the appropriate undergraduate prerequisites or their equivalent.

Course Unit Prescriptions

5101 *Applied Linear Functional Analysis*
This course will be presented by the Mathematics Department.
The course will include the topics: Green's functions, linear vector spaces, distributions, eigen values; linear integral equations, variational methods, spectral theory for second-order ordinary differential equations; extension of these ideas to partial differential equations.

5102 *Operations Analysis*
This course will be presented by the Mathematics Department.
Application of operations research to search procedures, gaming methods and resource allocation. Investigation of case studies involving engineering applications.

5103 *Statistical Methods in Engineering*
This course will be presented by the Mathematics Department.
Engineering applications of a selection of the following topics: time series and spectral analysis, decision theory including optimal receiver and signal design, parameter estimation, non-parametric methods, analysis of residuals, stochastic processes.

5104 *Mathematical Control Theory*
This course will be presented by the Mathematics Department.
A selection of topics from:
State representation of systems. Controllability, observability, stability. State and control constraints, penalty functions, sensitivity.
Linear control theory: Linear differential equations, Linear algebra and functions. Observer theory. Filtering. Stability tests.

* This is a reflection of the fact that an electrical engineering course leading to a first degree typically has a certain common content of "core material" while other topics are more usually elaborated as optional subjects.

Optimization theory: Constrained and unconstrained minimisation of functions. Dynamic programming, Calculus of variations, Pontryagin maximum principle, two point boundary value problem, time optimal control, numerical methods.

5201 *Engineering Cryogenics*
This course will be presented by the Physics Department.
Refrigerants; cryostats, temperature measurement. Basic theory of superconductivity. Magnets. Power systems and components. Applications of superconductivity in computers and electronics.

5202 *Principles and Applications of Magnetic Materials*
This course will be presented by the Physics Department.
Origins of magnetism in atoms and ions. Magnetic ordering in solids. Origins, importance and techniques of observation of magnetic domains. Microwave elements, transition metal and rare earth permanent magnets, soft magnetic materials and shielding, design and construction of high field and special purpose electromagnets.

5203 *Properties of Materials*
This course will be presented by the Physics Department.
Topics included in this course are introduction to crystalography, methods for investigating crystaline properties, defects in crystal structures, effects of defects on the mechanical, electrical and magnetic properties of metals, semiconductors, polymers and ceramics.

5204 *Material Physics for Electronics*
This course will be presented by the Physics Department.
Brief review of the basic physics of the well established preparation techniques of diffusion, etching, evaporation, vapour deposition and the like. Vacuum technology; sputtering, ion milling, etching and implantation equipment and processes; properties of materials produced by these methods. Radiation damage by nuclear, solar and implantation radiation; channelling processes. Surface and near-surface analysis techniques, including scanning electron microscopy, secondary ion mass spectroscopy.

5301 *Structure and Property of Dielectric Materials*
This course will be presented by the Chemistry Department.
Macroscopic and molecular behaviour of dielectrics. Static and frequency dependent dielectric constants and dielectric losses. Application to fluid and solid systems.

5701 *Occasional Elective*
This syllabus will change from one occasion to the next, allowing presentation of a modern topic at graduate level, particularly by visiting academics of eminence.

5702 *Asymptotic Methods in Electromagnetic Theory*
Principles of geometric optics; relation of geometric optics to electromagnetic theory; asymptotic transformation of modal series; ray optical interpretation of asymptotic solutions: geometrical theory of diffraction; applications in antenna and radar cross section analysis.

5703 *Antennas*
A selection of topics from: a review of basic antenna theory; classical and numerical methods for antenna analysis; wire, aperture, surface wave, wide band and frequency independent antennas; conformal and adaptive arrays; tolerance theory.

5704 *Radio Wave Propagation*
Basic concepts of propagation theory. Propagation over the earth's surface in the MF, HF, VHF and microwave bands. Propagation in plasmas. Earth ionosphere cavity. Tropospheric propagation.

5705 *Microwave Transmission Theory*
A selection of topics from transmission lines, waveguides, striplines, resonators, distributed parameter filters, ferrite devices and other passive microwave components.

5706 *Network Synthesis*
Classical methods for the synthesis of passive networks with applications in modern filter design.

5707 *Signal Transmission in Networks and Systems*
Signal analysis in the time and frequency domains. Fourier theory. Correlation, convolution and analysis of system characteristics. Noise and stochastic signals. Communications systems.

5708 *Numerical Techniques in Electromagnetics*
The method of moments applied to thin wire elements and arrays. Characteristic modes for antennas and scatterers. Some computational aspects of thin wire modelling. Stability and convergence of moment method solutions.

5709 *Advanced Computer Architecture*
Specialised processors. Computer networks. Performance evaluation. System design evaluation.
Students wishing to select this course will be required to demonstrate a prior knowledge of computer architecture at a level equivalent to that of course 4742, unit 16.

5710 *Semiconductor Opto-Electronics*
Optical constants of solids, dispersion theory and absorption processes in semiconductors. Magneto optical and photo effects. Emission of radiation from semi-conductors, laser diodes and light emitting diodes. Non-linear optical effects.

5711 *Display System Engineering*
Visual experience and colourimetry. Image analysis, optics, recording media. Devices:

light values, electroluminescent panels, infrared imaging and image intensifiers. Liquid crystal and ferroelectric displays. Holography, acoustical and optical.

5712 *Microwave Electronics*
A selection of topics covering the principles and applications of electron beam and solid-state microwave devices. These include travelling wave tubes, backward wave tubes, klystrons, crossed-field devices, parametric devices, high frequency diodes and transistors Gunn-effect and MIPATT-type devices.

5713 *Integrated Circuit Technology*
The theory and techniques used in the design and fabrication of hybrid IC's, individual semiconducting devices and monolithic IC's.

5714 *Advanced Power Electronics*
An advanced level consideration and design of semiconductor power circuits. Several typical practical applications will be selected and a study made of the complete system in each case.
Attention will also be paid to current developments in the technology and to possible future trends.
Students wishing to select this course will be required to demonstrate prior knowledge of power electronics at a level equivalent to that of course 4742, unit 29.

5715 *Advanced Power Systems*
This course is concerned with large power systems and covers such topics as economy of operation load flow and stability.
Students wishing to select this course will be required to demonstrate a prior knowledge of power systems at a level equivalent to that of course 4742, unit 24.

5716 *Power System Protection*
The course is concerned with the theory and construction of devices and systems used in the protection of power networks.
Students wishing to select this course will be required to demonstrate a prior knowledge of power systems at a level equivalent to that of course 4742, unit 24.

5717 *Project or Design*
This counts as 12 credits towards the degree.
Candidates are required to submit a thesis on a project or design in accordance with the Degree Rules. At the time of registration candidates are required to discuss their proposed project or design work with a representative of the Electrical Engineering Department so that it may be ascertained that the facilities to cater for the work and for its proper supervision are available. Alternatively candidates may seek permission to present a thesis on work undertaken outside the University for which they can satisfactorily demonstrate that they were largely responsible. The thesis may be presented at any time up to a year after completion of the formal course work; only in exceptional circumstances will an extension beyond this time be granted.

Appendix

I Academic Dress

Hoods for the Degrees awarded in the Faculty of Military Studies:

Bachelor of Arts in Military Studies: Hood of old gold silk edged to a depth of two inches with white fur and to a further depth of two inches with midnight blue silk. (BCC 90 Midnight Blue)

Bachelor of Arts: Hood of old gold silk edged with white fur.

Bachelor of Science in Military Studies: Hood of old gold silk edged to a depth of two inches with amber silk and to a further depth of two inches with midnight blue silk. (BCC 5 Maize, BCC 90 Midnight Blue)

Bachelor of Science: Hood of old gold silk edged with amber silk. (BCC 5 Maize)

Bachelor of Engineering: Hood of old gold silk edged with light maroon silk. (BCC 36 Light Maroon)

II Commandants of the Royal Military College

Brigadier-General W. T. Bridges, CMG, 1911-14
Major-General J. W. Parnell, CMG, 1914-20
Major-General J. G. Legge, CB, CMG, 1920-22
Colonel Commandant F. B. Heritage, CBE, MVO, 1922-29
Brigadier E. F. Harrison, 1929-31
Major-General J. H. Bruche, CB, CMG, 1931
Brigadier F. B. Heritage, CBE, MVO, 1931-32
Colonel J. D. Lavarack, CMG, DSO, 1933-35
Brigadier C. G. N. Miles, CMG, DSO, 1935-39
Brigadier E. C. P. Plant, DSO, OBE, 1939-40
Brigadier E. F. Harrison, 1940-42
Brigadier B. Combes, CBE, 1942-45
Brigadier E. L. Vowles, MC, 1945-48
Major-General H. Wells, CBE, DSO, 1949-51
Major-General R. N. L. Hopkins, CBE, 1951-54
Major-General I. R. Campbell, CBE, DSO, 1954-57
Major-General J. G. N. Wilton, CBE, DSO, 1957-60
Major-General R. W. Knights, CBE, 1960-62
Major-General C. H. Finlay, CB, CBE, 1962-68
Major-General C. A. E. Fraser, CBE, 1968-70
Major-General C. M. I. Pearson, AC, DSO, OBE, MC, 1970-73
Major-General R. A. Hay, CB, MBE, 1973-77
Major-General A. L. Morrison, DSO, MBE, 1977-

III Professors of the Royal Military College, 1911-67

R. J. A. Barnard, *Mathematics,* 1911-22
R. Hosking, *Physics,* 1911-22
V. J. Miles, *English,* 1911-18
J. F. M. Haydon, *Modern Languages,* 1912-31
L. H. Allen, *English,* 1918-31
A. D. Gilchrist, *Mathematics,* 1923-38
C. E. MacKenzie, *Chemistry and Physics,* 1923-48
L. N. Morrison, *English,* 1931-40
T. A. Sutherland, OBE, *Mathematics,* 1938-60 *Director of Academic Studies,* 1961-66
E. R. Bryan, OBE, *English and Modern Languages* 1940-67, *Acting Dean,* 1967
D. E. Swan, OBE, *Physics and Chemistry,* 1948-62 *Physics,* 1962-67
H. S. Hodges, *Economics and History,* 1948-67
A. H. Corbett, *Engineering,* 1950-67
A. McMullen, *Mathematics,* 1961-67
B. Dempsey, *Chemistry,* 1962-67

IV Deans of the Faculty of Military Studies

Professor Sir Leslie Martin, CBE, FAA, FRS, 1967-70
Professor B. D. Beddie, 1971-72
Professor J. C. Burns, 1973-

V Directors of Military Art of the Royal Military College

Lieutenant-Colonel C. W. Gwynn, CMG, DSO, 1911-14
Lieutenant-Colonel A. H. Bridges, 1915
Lieutenant-Colonel E. F. Harrison, 1915-17
Brigadier-General H. J. Foster (RL), 1917-18
Lieutenant-Colonel E. H. Reynolds, OBE, 1918-20
Lieutenant-Colonel J. D. Lavarack, CMG, DSO, 1920-24
Lieutenant-Colonel C. G. N. Miles, CMG, DSO, 1924-25
Lieutenant-Colonel F. H. Farebrother, 1925-27
Lieutenant-Colonel A. L. Ransome, DSO, MC, 1927-28
Lieutenant-Colonel G. C. Stubbs, DSO, 1928-30
Lieutenant-Colonel D. H. Pratt, DSO, MC, 1930-33
Lieutenant-Colonel R. M. Scobie, MC, 1933-34
Lieutenant-Colonel H. C. H. Robertson, DSO, 1934-39
Lieutenant-Colonel E. L. Vowles, MC, 1939
Lieutenant-Colonel R. G. Legge, DSO, MC, 1939-40
Lieutenant-Colonel K. A. MacKenzie, DSO, 1940
Lieutenant-Colonel L. Richardson, 1940-42
Lieutenant-Colonel D. D. Pitt, 1942-43
Lieutenant-Colonel R. R. McNicol, 1943-44
Lieutenant-Colonel J. C. W. O'Connor, 1944-45
Lieutenant-Colonel J. W. Fletcher, 1945-49
Lieutenant-Colonel T. J. Daly, DSO, OBE, 1949-51
Lieutenant-Colonel S. J. Beechmore, 1951-53
Colonel F. G. Hassett, DSO, MVO, OBE, 1953-58
Colonel H. G. Bates, OBE, 1958-60
Colonel P. L. Tancred, 1960-64
Colonel G. D. Solomon, OBE, 1964-65
Colonel J. W. Norrie, 1965-68
Colonel M. T. Tripp, OBE, 1968-70
Colonel J. M. Maxwell, OBE, 1970-74
Colonel K. J. Taylor, 1974-76
Colonel A. Clunies-Ross, MBE, 1976-

Information for Students

Enrolment in the University

On their entry to the Royal Military College cadets must enrol formally as undergraduate students in the Faculty of Military Studies of the University of New South Wales. Acceptance as a member of the University implies an undertaking on the part of each student to observe the regulations, by-laws and other requirements of the University in accordance with the declaration he signs at the time of enrolment. Such regulations etc. are published in the current *Calendar* of the University of New South Wales.

First year students are required to attend an enrolment session before the academic year begins, at a place and time to be advised. Before his enrolment can be completed, each new first year student must produce his Higher School Certificate (or equivalent) for sighting by the Registrar of the College.

Before entering the second and later years students will be required to complete and return re-enrolment forms to the Registrar of the College on a specified date.

Change of Course

New first year students will have entered the College on the understanding that they would take up the places allotted to them in particular courses of study. In exceptional circumstances a student may be permitted to enrol in a different course, provided there is a vacancy and provided he is appropriately qualified.

It may be possible for a student to transfer from one course to another at the end of his first year provided that he is appropriately qualified. A student permitted to transfer will either re-enrol as a first year student in the new course or enrol as a second year student but with a restricted choice of program. For a student in good standing, transfer to the second year of the Applied Science course from the Engineering course may be arranged subject to the concurrence of the heads of all the Science departments; transfer to the second year of the Electrical Engineering course from the Applied Science course may be arranged subject to the concurrence of the Head of the Department of Electrical Engineering.

A student seeking to change his course should consult the Student Counsellor in the first instance. Changes of course are not permitted after 31 March.

Change of Program

Once his enrolment has been completed, a student wishing to change the subjects in his program must apply to the Registrar of the College before 31 March. Changes (other than withdrawals from subjects) are not permitted after that date.

Withdrawal

A student wishing to discontinue part or all of the program for which he has enrolled must apply to the Registrar of the College. Approval for withdrawal from subjects is not given automatically. It is emphasised that:

1. if any student other than a first year student withdraws from a subject after the first day of second term; or
2. if a first year student withdraws from a subject after 1 August; or
3. if a student does not sit for the examinations in a subject in which he has enrolled,

he will be regarded as having failed to satisfy the examiners in the subject, unless he has been given written approval by the University to withdraw without penalty. Without such approval late withdrawal could result in infringement of the University's re-enrolment rules.

A student's program of study must be compatible with the published timetable of classes. The onus is on the student to inform the Registrar of the College if there is any incompatibility.

Attendance at Classes

Students are expected to be regular and punctual in attendance at all classes in the courses and subjects in which they are enrolled.

A student who has attended less than 80 per cent of the possible classes in a subject in which he has enrolled may be refused permission to sit for the examination in that subject.

In certain circumstances, a student who is repeating a subject may be exempted from attending some of the classes in that subject.

If a student, through illness or other reason, is prevented from attending classes or otherwise meeting the requirements of his course, the onus is upon him to notify the appropriate Heads of Departments. He should apply to be excused by the Registrar for non-attendance at classes for a period of not more than one month or, on the recommendation of the Dean, for a longer period.

Examinations

The annual examinations in the Faculty of Military Studies are held in October-November. Examinations may also be conducted by departments at other times during the academic year.

A provisional timetable for the annual examinations is published early in the third term. Each student is advised to study the provisional timetable, and he must notify the Registrar of the College if any two of his examinations clash. The final timetable will be published three weeks before the examination period begins. Misreading of the timetable is not an acceptable excuse for failure to attend an examination.

In the assessment of a student's progress, consideration is given to work in laboratory and class

exercises and to any term or other tests given during the year, as well as to his performance in written examinations.

Electronic Calculators

The University has agreed that, subject to authorisation by Faculty, battery-operated electronic calculators may be used in examinations. Where appropriate such calculators may also be prescribed for subjects.

Examination Results

The annual examination results are published by the Registrar of the College at the beginning of December, and are posted on notice boards in the College. Results are not available to students before the day of publication.

Each student's results for the year in all his subjects are published. Passes in subjects are graded as *High Distinction, Distinction, Credit* or *Pass,* which indicate relative merit. When a student's mark in a subject is slightly below the required standard but his overall performance warrants a concession he may be granted either a *Pass Conceded* or a *Terminating Pass* in the subject. A terminating pass will not permit him to progress further in the subject or to enrol in another subject for which a pass in the first is a prerequisite.

Deferred Examinations

Deferred examinations are not granted to students in the Faculty of Military Studies. However, a Head of Department may make special arrangements to examine a student who, through illness or other exceptional circumstances, either has been prevented from taking the annual examinations or has been placed at serious disadvantage in preparing for or undertaking them. Special arrangements when made must be completed by the end of the College year.

Restrictions upon Re-enrolling

The University's rules governing re-enrolment require a student with a record of failure to show cause why he should be permitted to re-enrol:

(a) A student must 'show cause' before being allowed to repeat a subject in which he has failed more than once. If such subject is prescribed as part of his course, he must 'show cause' before being allowed to continue the course.

(b) A student who is enrolled as a first year student in the Faculty of Military Studies and who fails in more than half the number of subjects in his program for the year must 'show cause' before being allowed to re-enrol.

(c) Without 'showing cause', a student will not be allowed to continue his course unless he has completed all the subjects of the first year of his course by the end of his second year of attendance. This provision requires a student in the BA(Mil) course to complete four subjects by the end of his second year of attendance.

(d) A student in the Faculty of Military Studies may be allowed a maximum period of five years in which to complete the academic and the military requirements of his course, except that a BE candidate who entered his course in 1975 or subsequent years shall be required to complete all the requirements for that degree in not more than six years.

After the results of the annual examinations have been published, any student who is required to 'show cause' before being allowed to re-enrol in a subject or course will be notified in writing by the Registrar of the College, and will be invited to apply to the University by a certain date for permission to re-enrol.

The University will advise each student of the result of his application. Should his initial application to re-enrol not be granted, a student may appeal to an Appeal Committee constituted by the Council of the University.

Student Records

The academic records of students in the Faculty of Military Studies are maintained by the Registrar of the College. A student may obtain a transcript of his examination results on application.

Notice Boards

From time to time the academic departments post notices which inform students about assignments, tests, tutorial groups, seminars, etc. Students are advised to consult the notice boards in the appropriate departments regularly.

Advice

Students needing advice on any matter are invited to contact the Student Counsellor, Ground floor, Anzac Block, far northern end.

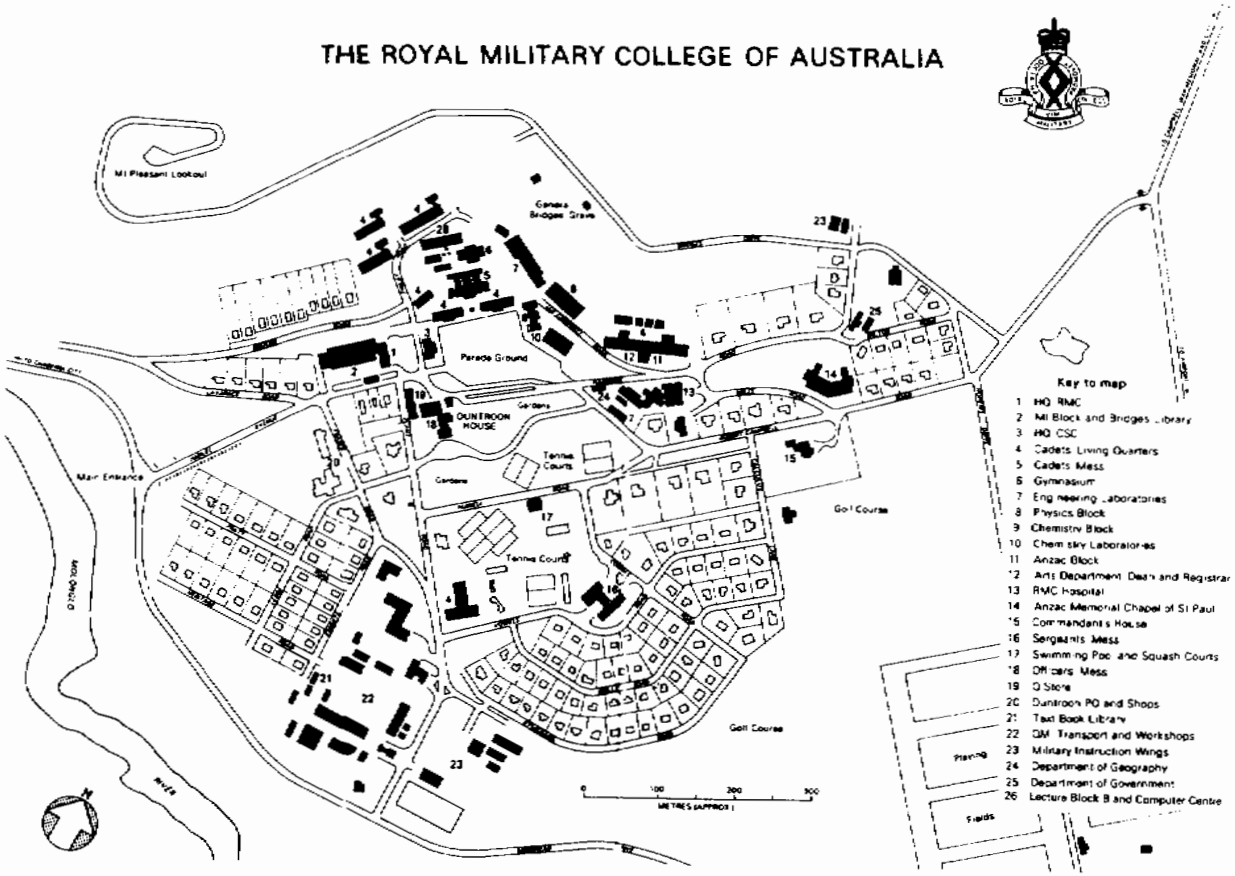
The Bridges Memorial Library

The Bridges Memorial Library is open during the following hours in term time:

Monday to Friday 8.00 am to 5.20 pm
Monday to Thursday 7.00 pm to 10.00 pm
Sunday 2.00 pm to 5.00 pm and 7.00 pm to 10.00 pm.

During vacations the hours of opening are 8.00 am to 5.20 pm Monday to Friday.

THE ROYAL MILITARY COLLEGE OF AUSTRALIA



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