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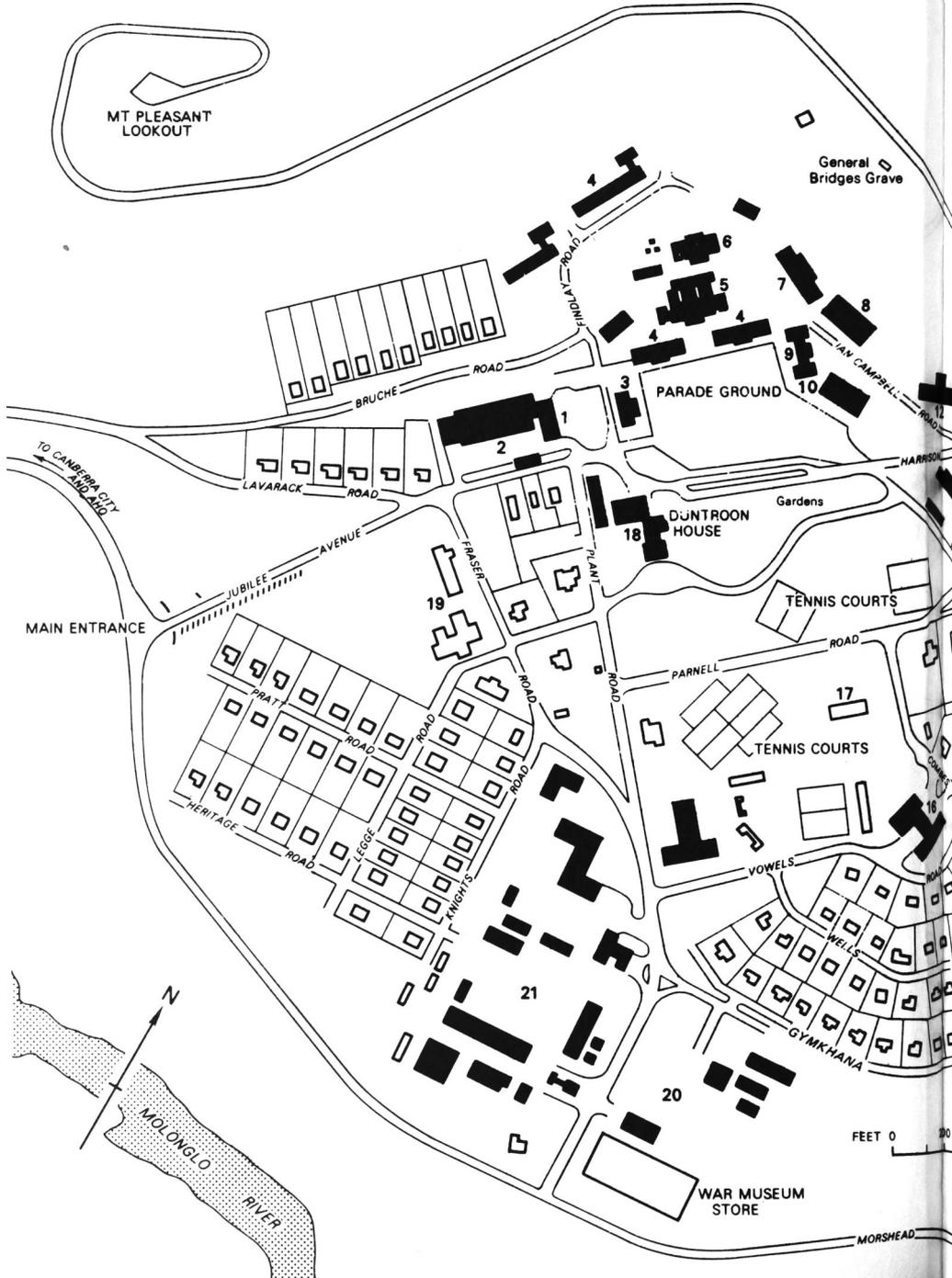
1



The Royal Military College Handbook 1972

**THE ROYAL MILITARY COLLEGE OF AUSTRALIA
DUNTRON
AUSTRALIAN CAPITAL TERRITORY**

THE ROYAL MILITARY COLLEGE



COLLEGE OF AUSTRALIA



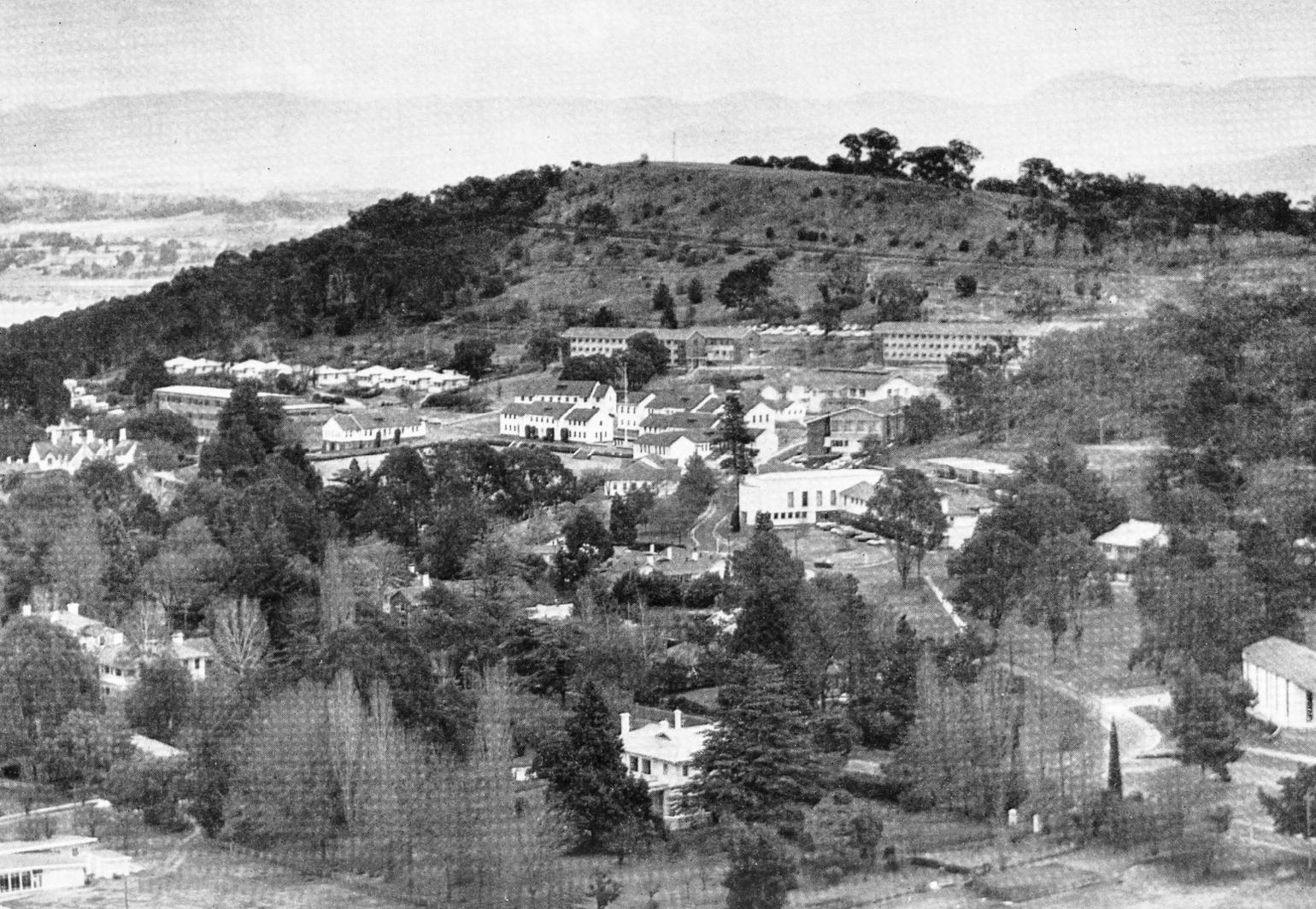
Key to map

- 1 HQ. RMC
- 2 Military Instruction Block and Library
- 3 HQ. CSC
- 4 Cadets' Living Quarters
- 5 Cadets' Mess
- 6 Gymnasium
- 7 Engineering Laboratories
- 8 Physics Block
- 9 Computer Block
- 10 Chemistry Laboratories
- 11 Anzac Block
- 12 Arts Departments, Dean and Registrar
- 13 RMC Hospital
- 14 Anzac Memorial Chapel of St Paul
- 15 Commandants Residence
- 16 Sergeants' Mess
- 17 Swimming Pool
- 18 Officers' Mess
- 19 Duntroon PO and Shops
- 20 Military Instruction Wings
- 21 QM, Transport and Workshops

400 600 800 1000 FEET

DRIVE TO AIRPORT

THE ROYAL MILITARY COLLEGE HANDBOOK 1972



Handbook of The Royal Military College of Australia 1972

The Royal Military College is in affiliation with
the University of New South Wales through
the Faculty of Military Studies

Origins and development of the Royal Military College

The Royal Military College of Australia was opened by the Governor-General of Australia, Lord Dudley, on 27 June 1911. 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 (afterwards Lieutenant-General) Sir Edward Hutton of the British Army recommended that a military college be established along the lines of West Point in the United States of America, R.M.C. 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 (afterwards Major-General Sir) 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 in the same year was appointed commandant of the proposed Military College of Australia.

The Government decided that the college should be established near Canberra, the federal capital, provided a suitable site could be found. Brigadier-General Bridges visited the Federal (Australian) Capital Territory and chose Duntroon, a sheep station, which had been taken up by Robert Campbell, colonial merchant and pastoralist, in 1825. The Duntroon property was first leased and then purchased by the Commonwealth Government from the Campbell family.

The first intake consisted of forty-two staff cadets, including ten from New Zealand. Although a four-year course in both military and academic work had been planned the first class was specially graduated for service with the First A.I.F. and the N.Z.E.F. in August 1914. Forty of the 117 Australian graduates of the first four entries (1911–1914) died on war service in the Great War, 1914–18, including seventeen at Gallipoli where the College's first Commandant also fell.

After the First World War Australia's RMC continued to develop and produce officers for Australia's defence needs: until 1930 the College also trained officers for long service commissions in the Royal Australian Air Force. In 1931–36 the College was transferred to Victoria Barracks, Sydney, as an economy measure; it reopened again at Duntroon in February 1937. In this year the College's first permanent buildings were constructed and since then there has been a slow but continuing building programme to cater for increased numbers and more varied and more demanding courses.

Origins and development

The length of the course which is conceived as a whole has varied from time to time but it has usually been four years. During World War II the length of the course varied between six months and two and-a-half years. Since 1947, however, the course has always been four years. In 1968 the University of New South Wales at Kensington, Sydney, established a Faculty of Military Studies at the Royal Military College. The Faculty is responsible for conducting full university courses at the College in Arts, Applied Science and Engineering leading to the award of the University's degrees of Bachelor of Arts and Bachelor of Science in Military Studies and Bachelor of Engineering. Since its foundation to 1971 two thousand officer cadets have graduated from Australia's RMC.



Duntroon is about two miles north east of Capital Hill in the City. It is situated on the eastern slopes of Mount Pleasant (2,150 feet) overlooking the Molonglo plain; the surrounding country is undulating, well-timbered, and eminently suited for military training. A variety of training environments is within a radius of a hundred miles. The College itself occupies 370 acres including staff quarters, playing fields, gardens and golf course. A field firing range is located nearby east of Mounts Ainslie and Majura.

The climate of the Australian Capital Territory is continental in type—hot summers and cold winters. The altitude of Canberra (1,900 feet) has a moderating influence on the summer temperature (January mean, 69.1:F) and tends to lower the winter temperature (July mean, 42.8:F). Relative humidity is low in summer. Canberra's average annual rainfall of 25 inches is equally distributed throughout the year, and the average rainfall variability low. Winds are low largely owing to the protection of the mountains in the west: this fact tends to reduce the uncomfortable effects of extremes of temperature. In summary, the climate is healthy and invigorating.

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The Charter of the Royal Military College

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

Affiliation with the University of New South Wales

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-granting body within a period of ten years. The College entered into an affiliation with the University in 1968, and the University established a Faculty of Military Studies at Duntroon.

The Faculty of Military Studies is responsible for conducting courses at the College in Arts, Applied Science and Engineering, leading to the award of the University's degrees of Bachelor of Arts in Military Studies (BA(Mil)), Bachelor of Science in Military Studies (BSc(Mil)) and Bachelor of Engineering (BE).

The Interim Council of the Royal Military College advises the University and the Military Board on facilities required for instruction at Duntroon, and on other matters relating to the College, including any action which might be taken to promote the objects and interests of the College and the University.

The Interim Council of the Royal Military College 1972

Chairman

Major-General C. M. I. PEARSON, DSO, OBE, MC, jssc (US), psc,
Commandant, Royal Military College

Members

Professor F. W. AYSCOUGH, BSc *Syd.*, MSc *N.S.W.*, CEng,
MICHemE, ARACI,
Head, School of Chemical Technology, University of New
South Wales

Professor B. D. BEDDIE, BA *Syd.*, PhD *Lond.*,
Dean of the Faculty of Military Studies

Professor J. C. BURNS, MSc *NZ*, BA *Cantab*, PhD *Manc.*,
Chairman of the Faculty of Military Studies

Professor H. BURTON, CBE, BA *Old*, MA *Oxon & Melb.*,
Emeritus Professor of the Australian National University

Professor T. G. CHAPMAN, BSc *Leeds*, PhD *S'ton*, FIEAust,
Member elected by the Royal Military College Academic Staff

Lieutenant-Colonel A. J. A. COOPER, psc, RNZ Sigs,
Deputy Head, New Zealand Defence Liaison Staff

The Honourable Mr Justice R. W. FOX,
Resident Judge of the Supreme Court of the Australian Capital
Territory

Dr R. I. GARROD, PhD *Lond.*, DSc *Melb.*, FInstP, FAIP, MAIM,
Senior Assistant Secretary, Department of Education and Science

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

Mr H. B. S. GULLETT, MC, BA *Oxon*

Associate Professor H. S. HODGES, BSc(Econ), DipEd *Lond.*,
FRGS,
Member elected by the Royal Military College Academic Staff

Mr L. V. HUME, BCom *Melb.*,
Assistant Secretary, Department of Defence

Mr L. LUXTON, CBE, MA *Cantab*

Colonel J. M. MAXWELL, OBE, psc
Director of Military Art, Royal Military College

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 NZ & *Melb.*, PhD *Lond.*,
FBPsS, FAPsS,

Professor of Psychology, University of Queensland

Professor C. E. MOORHOUSE, DEng *Melb.*, FIEAust, FIEE, FACE,
Professor of Electrical Engineering, University of Melbourne

Professor R. H. MYERS, MSc PhD *Melb.*, FIM FRACI, MAusIMM,
Vice-Chancellor, University of New South Wales

Major-General G. F. T. RICHARDSON, CBE, idc, jssc, psc,
Quartermaster-General

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

Director of Military Training (to be appointed)

Professor R. STREET, DSc *Lond.*, FlnstP, FAIP, MIEE,
Professor of Physics, Monash University

Major-General D. VINCENT, CB, OBE, idc, psc, MIREE,
Adjutant-General

Professor R. E. VOWELS, ME *Adel.*, SMIEEE, MIEAust, MIEE,
Pro-Vice-Chancellor, University of New South Wales

Mr B. WHITE, CBE, BCom DipPubAdmin *Melb.*,
Secretary, Department of the Army

Professor A. H. WILLIS, DSc(Eng) *Lond.*, CEng, MIMechE,
MIEAust, MemASAE, WhSc,
Pro-Vice-Chancellor, University of New South Wales

Secretary

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

Assistant Secretary

Major A. HARKNESS, psc, pl, RAA,
GSO2 (Co-ordination) Royal Military College

**Terms of Reference for the
Interim Council of the Royal Military College
(January 1968)**

1. There shall be an Interim Council of the Royal Military College, and it shall replace the Standing Committee on the Royal Military College Curriculum.

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

- The Commandant, as chairman,
- The Director of Military Art,
- The Director of Military Training,
- Five professors nominated by the Minister for the Army from universities other than the University of New South Wales,
- A nominee of the Minister for Education and Science,
- The Secretary, Department of the Army,
- A representative of the Minister for Defence,
- A military member of the Military Board (to be nominated by the Military Board),
- A representative of the New Zealand Army (to be nominated by the CGS of the New Zealand Army),
- Five members of the University of New South Wales (to be nominated by the University after receiving the advice of the Professorial Board),
- Not more than three persons prominent in civil life other than in the academic field (to be nominated by the Military Board),
- Two members of the teaching staff of the College selected by the teaching staff of Lecturers, Senior Lecturers, Associate Professors and Professors at the College and elected in the manner prescribed in Section 29 of Chapter II of the By-Laws made under the Technical Education and University of New South Wales Act 1949 as amended by subsequent acts or under any act repealing that section,
- The Vice-Chancellor of the University of New South Wales or on his nomination a Pro-Vice-Chancellor in his place,
- The Dean of the Faculty of Military Studies,
- Not more than two other members co-opted by the Interim Council for such period not exceeding two years at a time as that Council may determine.

Members of the Interim Council other than those who hold office *ex officio* shall normally hold office for a period not exceeding two years at a time.

3. The Interim Council shall advise the University and the Military Board:

- (a) on facilities required for instruction at the College,

- (b) on other matters relating to the College, including any action which might be taken to promote the objects and interests of the College and the University.

It shall report annually to the University and to the Military Board on activities at the College.

- 4. The Interim Council shall have the following functions:
 - (a) With regard to the courses presented by the Faculty of Military Studies of the University of New South Wales:
 - (1) It shall receive reports from the Faculty and make relevant recommendations to the Military Board.
 - (2) It shall examine the courses of instruction at the Royal Military College in relation to the Military Board's policy on the Royal Military College.
 - (3) It shall invite the attention of the Faculty to such aspects of the Military Board's policy on the Royal Military College as may affect the academic courses, and request reports where necessary.
 - (b) It shall examine all other courses of instruction at the Royal Military College in relation to the Military Board's policy on the College.
 - (c) It shall examine such other matters as are referred to it by the Military Board, the Council of the University of New South Wales, the Faculty of Military Studies, and the Commandant.

5. The Interim Council shall recommend any variations in the educational qualifications for entry to the Royal Military College, after consultation with the University of New South Wales.

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

7. There shall be an Executive Committee of the Interim Council which shall act on the Interim Council's behalf and function under such delegations as the Interim Council shall deem it appropriate to make. All decisions and actions taken by the Executive Committee will be reported to the Interim Council out of session. The Executive Committee will normally meet in the first week of February, of June and of August, and on such other occasions as may be considered necessary.

- 8. The Executive Committee shall consist of:
 - The Commandant, as chairman,
 - The Director of Military Art,
 - The Dean of the Faculty of Military Studies,
 - One of the five professors from universities other than the University of New South Wales,
 - The Military member from the Military Board,

The representative of the New Zealand Army,
The Vice-Chancellor of the University or on his nomination a
Pro-Vice-Chancellor in his place,
One of the members from the University of New South Wales.

9. The Interim Council shall have power to appoint sub-committees for specified purposes, but appointment of sub-committees shall not in any way affect the authority of the Interim Council to advise the University and the Military Board on any matter relating to the College.

10. The Interim Council from time to time shall make recommendations to the Military Board regarding its own powers and functions.

11. At an appropriate time within the next ten years, the Interim Council shall make recommendations to the Military Board regarding the creation of the Council of the Royal Military College and the advancement of the Royal Military College to degree-granting status in its own right.

**Rules of Procedure for the
Interim Council of the Royal Military College
(January 1968)**

1. The Interim Council shall meet normally in the fourth week of March and the fourth week of September, and on such other occasions as may be considered necessary. Ordinary 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 despatched 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, ten 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 re-production of the Interim Council's reports.
6. The Executive Committee of the Interim Council shall meet normally in the first week of each of February, June and August 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. At its meeting in February and August the Executive Committee shall decide upon the agenda for the plenary meetings of the Interim Council immediately following. 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

COMMANDANT

Major-General C. M. I. PEARSON, DSO, OBE, MC, jssc (US),
psc

MILITARY STAFF

Director of Military Art

Colonel J. M. MAXWELL, OBE, psc

GSO2 (Co-ordination)

Major A. HARKNESS, psc, pl, RAA

Student Counsellor

Lieutenant-Colonel B.C. MILLIGAN, BA Syd., DipEd N.E.,
AA Psych Corps

THE CORPS OF STAFF CADETS

Commanding Officer

Lieutenant-Colonel H. J. COATES, BA A.N.U., psc, RAAC

Second in Command

Major E. W. POULTNEY, RA Sigs

Adjutant

Captain G. A. C. CHASLING, Dip Mil Stud, RA Inf

Officer Commanding The Sovereign's Company

Major D. S. WILKINS, RA Inf

Officer Commanding Gallipoli Company

Major D. A. FORMBY, RAAC

Officer Commanding Kokoda Company

Major B. H. MITCHELL, RAA

Officer Commanding Kapyong Company

Major L. J. TOWERS, RAASC

Regimental Sergeant-Major

Warrant Officer Class 1 L. A. WILLIAMS, RA Inf

INSTRUCTORS

Tactics

Major D. N. CANDOW, psc, RA Inf

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Staff Duties, Training and Intelligence

Major M. S. WOODARD, psc, RNZAC

War Administration

Major J. W. FRANCIS, Queens

Armour

Major D. A. FORMBY, RAAC

Artillery

Captain P. R. McWILLIAM, RAA

Military Engineering

Major J. D. THOMSON, B Tech (Civil) *Adel.* MIEAust, RAE

Signals

Major E. W. POULTNEY, RA Sigs

Infantry

Major R. J. RAYWARD, RA Inf

Captain J. R. P. PAGET, RA Inf

Drill and Ceremonial

Captain G. A. C. CHASLING, Dip Mil Stud, RA Inf

Current Affairs and Leadership

Major D. S. WILKINS, RA Inf

Military Law and Peace Administration

Captain G. R. MAUGHAN, pl, Avn

Physical Training

Warrant Officer Class 2 T. M. DONNELLY, RAA

Army Health

Major B. R. C. DANIEL, MB, BS, *Syd.*, RAAMC

ADMINISTRATION

Lieutenant-Colonel in Charge of Administration

Lieutenant-Colonel R. S. FLINT, psc, RA Inf

D.A.A.G.

Major B. F. KELLY, qs, RA Inf

D.A.Q.M.G.

Major T. TONURI, RAAOC

Accountant

Mr E. G. McDONALD

Medical Officer

Major B. R. C. DANIEL, MB, BS, Syd., RAAMC

Archivist

Colonel L. H. R. FUHRMAN, psc, (RL)

CHAPLAINS

Church of England

Chaplain L. THOMPSON, RAA Ch D

Roman Catholic

Chaplain J. M. HOARE, MBE, ED, RAA Ch D (part-time)

United Churches

Chaplain F. P. McMASTER, DipRE, RAA Ch D (part-time)

Presbyterian

Chaplain J. P. MOODY, BA, Syd., RAA Ch D (part-time)

Academic Departments

ADMINISTRATION

Dean

Professor B. D. BEDDIE, BA *Syd.*, PhD *Lond.*

Registrar

R. W. O. PUGH, BE *Syd.*, BA *A.N.U.*, MIEAust, MACE, psc

Deputy Academic Registrar

K. J. HUDSON, BA (Oriental Studies) *A.N.U.*

DEPARTMENT OF CHEMISTRY

Professor of Chemistry and Head of the Department

R. J. BEARMAN, AB *Cornell*, PhD *Stanford*

Associate Professor

B. DEMPSEY, MSc *Syd.*, BEd *Melb.*, FRACI

Senior Lecturers

T. N. LOCKYER, MSc PhD *N.S.W.*

D. J. McHUGH, BSc *Syd.*, PhD *N.S.W.*, ARACI

E. P. SERJEANT, MSc *N.S.W.*, ARACI

J. W. TARDIF, MSc *Syd.*

Teaching Fellow

M. D. FENN, BSc *Qld*, MSc PhD *A.N.U.*, ARACI

DEPARTMENT OF ENGINEERING

Professor of Engineering and Head of the Department

T. G. CHAPMAN, BSc *Leeds*, PhD *S'ton*, FIEAust

Professor of Electrical Engineering

Vacant

Senior Lecturers

L. A. PETERSON, BCE *Melb.*, CEng, MIEAust

C. G. J. STREATFIELD, BSc(Eng) *Lond.*, CEng, MIEE, MIEAust

Vacant—one position

Lecturers

A. J. BONHAM, BSc(Eng) *Lond.*, MEngSc *N.S.W.*, AKC, CEng,
MICE, AMIWE

J. D. CASHMAN, BE *N.S.W.*, MSc BA *A.N.U.*

G. P. COCHRANE, BSc *Lond.*, PhD *N.E.*, AInstP

B. W. GOLLEY, BE *Adel.*, MSc(Eng) PhD *Q.U.*

I. W. LINNETT, BE MEngSc *Syd.*

G. A. MOYLE, ME *Auck.*, CEng, MIEAust, MIREEAust
R. QUARTERMAN, BSc(Eng) *Brist.*, CEng, MIMechE,
MIE Aust
J. SNEDDON, BE *N.S.W.*, BSc (Tech) *Newcastle*, MIEAust
C. W. THOMAS, ASTC(MechEng), MIEAust
A. R. WATSON, BE *Old*, CEng, MIMechE, MIEAust

Tutor-demonstrator

Vacant—one position

DEPARTMENT OF GOVERNMENT AND ECONOMICS

Professor of Government and Head of the Department

B. D. BEDDIE, BA *Syd.*, PhD *Lond.*

Associate Professors

H. S. HODGES, BSc(Econ) DipEd *Lond.*, FRGS
J. WILCZYNSKI, MEc *A.N.U.*, PhD *Lond.*, BEd *Melb.*

Senior Lecturer

G. R. WEBB, MCom BA *Melb.*, MEc *A.N.U.*

Vacant one position

Lecturers

E. D. DAW, BEc *Syd.*, MA *A.N.U.*
A. J. KASPURA, BA *Newcastle*
Beverley M. MALE, BA PhD *A.N.U.*
L. J. OLIVE, BSc *N.E.*
W. H. SMITH, BSc(Econ), MPhil *Lond.*, PhD *A.N.U.*

DEPARTMENT OF HISTORY

Professor of History and Head of the Department

L. C. F. TURNER, MA *Rand.*, jsc

Senior Lecturers

A. J. HILL, MBE, ED, BA *Syd.*, MA *Oxon.*, MACE, psc
J. R. ROBERTSON, MA *W. Aust. & A.N.U.*

Lecturers

J. McCARTHY, BA *Old*, MA, *N.S.W.*
R. C. THOMPSON, BA DipEd *Melb.*, PhD *A.N.U.*
G. P. WALSH, MA DipEd *Syd.*, MA *A.N.U.*

Tutor

Mrs Margot Z. SIMINGTON, BA *N.E.*

DEPARTMENT OF LANGUAGE & LITERATURE

Professor of English and Head of the Department

G. K. W. JOHNSTON, MA *Oxon. & N.Z.*

Associate Professor

E. R. BRYAN, OBE, MA DipEd *Melb.*

Senior Lecturers

J. T. LAIRD, MA *Syd.*

W. H. WILDE, MA DipEd *Syd.*, MACE

Lecturer

B. G. ANDREWS, MA *N.S.W.*, DipEd *Syd.*

Research Officer

Mrs Joy W. HOOTON, BA *Lond.*

DEPARTMENT OF MATHEMATICS

Professor of Mathematics and Head of the Department

J. C. BURNS, MSc *N.Z.*, BA *Cantab.*, PhD *Manc.*

Associate Professor

A. McMULLEN, MA *Syd.*

Senior Lecturers

B. A. BARNES, MSc DipEd *Syd.*

N. J. DE MESTRE, BSc DipEd *Syd.*, MSc *W.Aust.*

T. PARKES, BSc *Manc.*, MSc *A.N.U.*

Lecturers

K. L. BYRNES, BA *Syd.*

D. L. HOFFMAN, BA *A.N.U.*

DIGITAL COMPUTING

Senior Lecturer in Charge

A. J. QUAIN, BEE BSc *Melb.*

Lecturer

G. W. GERRITY, MSc *Sask.*, PhD *A.N.U.*

DEPARTMENT OF PHYSICS

Professor of Physics and Head of the Department

G. V. H. WILSON, MSc *Melb.*, PhD *Monash*, FAIP

Associate Professor

D. E. SWAN, OBE, BSc *Syd.*, BEd *Qld.*, AlnstP, AAIP

Senior Lecturers

D. C. CREAGH, BSc DipEd Qld, MSc N.E., MSc Brist., AlnstP,
AAIP

E. DENNIS, MSc Adel., GradInstP

Lecturers

D. H. CHAPLIN, BSc Monash

H. R. FOSTER, BSc Syd.

D. K. FOWLER, MSc N.E., GradInstP

R. W. N. KINNEAR, MSc N.Z., GradAIP

Teaching Fellow

Mrs Shelia G. BAILEY, BS Duke, MSc N. Carolina

BRIDGES LIBRARY

Librarian

Judith A. DONNELLY, BA Syd, ALAA

Acquisitions Librarian

Mrs Cynthia F. NEWBOWN, BA Syd., Dip Lib N.S.W.

Cataloguing Librarian

Ann STEWART, BA Adel., ALAA

Reader Services Librarian

Nicole MEREDITH, BA Dip Lib N.S.W.

Outline Calendar for 1972

<i>Term</i>	<i>Week No.</i>	<i>First Year</i>	<i>Second Year</i>	<i>Third Year</i>	<i>Fourth Year</i>
		<i>Fourth Class</i>	<i>Third Class</i>	<i>Second Class</i>	<i>First Class</i>
1	1-5	Orientation	Military Weeks	Military Weeks	Military Weeks
	6-16	Academic Weeks			
	17	Military Visits	Recess		Recess
18	Recess	Military Weeks			
2	19-29	Academic Weeks			Recess
	30	Recess			
	31-32	Academic Weeks			Military Weeks
33-42	Academic Weeks				
43-45	Military Weeks				
3	46	Preparation for Graduation			
	47	Graduation Week			

Principal Dates in 1972

January	17–21	. . .	Deferred examinations
	18	. . .	Fourth Class arrive at RMC
	22	. . .	Other Classes return from leave
	24	. . .	First term begins
	26	. . .	Executive of the Professorial Board meets
February	29	. . .	Fourth Class summer sport trials
	1	. . .	Professorial Board meets
	15	. . .	Maori Warrior cricket competition
	18	. . .	Executive of the Faculty of Military Studies meets
	22–25	. . .	First Class visit to E Comd units
	24	. . .	Executive Committee of the Interim Council meets
	26	. . .	Inter Service Colleges Swimming competition at RMC
	28	. . .	Academic year begins
	29	. . .	CSC Dining In Night
	March	1	. . .	Executive of the Professorial Board meets
2		. . .	DMA's Board of Studies meets CSC Dining In Night
3		. . .	Committee of the Bridges Library meets
4		. . .	Inter company and championship swimming competition
			Inter company athletics competition
5–11		. . .	First Class visit to Puckapunyal
7		. . .	Professorial Board meets
9		. . .	Inter company summer sports competition
10		. . .	Faculty of Military Studies meets
11–12		. . .	CHS visit at RMC
			Athletics competition at Sydney
18		. . .	Disher Cup rowing competition versus ANU ISCAM at OCS, Portsea
23		. . .	Interim Council meets
25		. . .	Athletics competition at RMC Championship rowing regatta
28		. . .	Inter company cross country competition
29		. . .	Executive of the Professorial Board meets
March		30–April 5	. . .	Easter leave Fourth Class recreation camp
April	4	. . .	Professorial Board meets
	7	. . .	Committee of the Bridges Library meets
	14	. . .	Executive of the Faculty of Military Studies meets
			Higher Degree Committee meets
	15	. . .	Inter Company small arms competition
	16–22	. . .	First Class visit to Holsworthy

The Royal Military College Handbook 1972

Principal Dates in 1972

April	23	.	.	Maori Warrior golf competition
	25	.	.	Anzac Day
	26	.	.	Executive of the Professorial Board meets
May	2	.	.	Professorial Board meets
	5	.	.	Committee of the Bridges Library meets
	12	.	.	Executive of the Faculty of Military Studies meets
	13	.	.	First term ends
	15–19	.	.	Fourth Class visit military units in Sydney area
	15–20	.	.	UNSW recess
	22	.	.	Second term begins for First Class
	29	.	.	Second term begins for remainder
	31	.	.	Executive of the Professorial Board meets
	June	1	.	.	DMA's Board of Studies meets
2		.	.	Faculty of Military Studies meets
5		.	.	RMC Handbook Committee meets
6		.	.	Professorial Board meets
9		.	.	Committee of the Bridges Library meets
10		.	.	Queen's Birthday parade and ball
12		.	.	Queen's Birthday holiday
15		.	.	Executive Committee of the Interim Council meets
24–25		.	.	CHS visit at RMC
27		.	.	Founders Day
28		.	.	Executive of the Professorial Board meets
29		.	.	Maori Warrior squash competition
July		3	.	.	RMC Handbook Committee meets
	4	.	.	Professorial Board meets
				Inter company winter sports competition
				CSC Dining In Night
	6	.	.	CSC Dining In Night
	7	.	.	Committee of the Bridges Library meets
	11	.	.	Inter company winter sports competition
	12	.	.	Mid Year Review Board meets
	14	.	.	Executive of the Faculty of Military Studies meets
	15	.	.	Inter company drill competition
	16–22	.	.	First Class visit to SME, Casula
	26	.	.	Executive of the Professorial Board meets
	29	.	.	Inter company obstacle course competition
31	.	.	RMC Handbook Committee meets	
August	1	.	.	Professorial Board meets
	4	.	.	Committee of the Bridges Library meets
	8	.	.	Maori Warrior basketball competition
	11	.	.	Executive of the Faculty of Military Studies meets

Principal Dates in 1972

August	12	.	.	Second term ends
	14–19	.	.	CGS Exercise at RMC
	14–September 2	.	.	UNSW recess
	21	.	.	Third term begins for First Class
	30	.	.	Executive of the Professorial Board meets
	31	.	.	Executive Committee of the Interim Council meets
September	1	.	.	Committee of the Bridges Library meets
	4	.	.	Third term begins for remainder
	8	.	.	Faculty of Military Studies meets
	12	.	.	CSC Dining In Night
	14	.	.	CSC Dining In Night
	24–October 7	.	.	First Class visit to JTC, Canungra
	27	.	.	Executive of the Professorial Board meets
October	3	.	.	Professorial Board meets
	5	.	.	Interim Council meets
	6	.	.	Committee of the Bridges Library meets
	8–28	.	.	First Class attachment to training battalions
	13	.	.	Executive of the Faculty of Military Studies meets
	16	.	.	Chapel benefit display
	23–November 10	.	.	Second Class Corps Briefing
				Academic examinations
November	1	.	.	Executive of the Professorial Board meets
	2	.	.	Maori Warrior tennis competition
	3	.	.	Committee of the Bridges Library meets
	7	.	.	Professorial Board meets
	11	.	.	Academic year ends
	17	.	.	Executive of the Faculty of Military Studies meets
		20–December 2	.	.	Annual field training
	24	.	.	Examination committee meets
	29	.	.	Executive of the Professorial Board meets
December	1	.	.	Committee of the Bridges Library meets
	4	.	.	Co-ordinating Committee meets
	5	.	.	Professorial Board meets
	6	.	.	Commandant's Board of Studies meets
	10	.	.	Church parade
	11	.	.	Presentation of prizes and sports trophies
	12	.	.	Graduation parade and ball
	13	.	.	Graduates leave RMC
	14	.	.	Leave begins for other classes
				Faculty Estimates Committee meets

The Royal Military College Course

The Royal Military College course is a four-year course of 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 follows one of the three academic courses, Arts, Applied Science or Engineering. Cadets are allotted to these courses on the basis of their matriculation studies, and as far as possible in accordance with their preferences.

The Degrees of BA(Mil), BSc(Mil) and BE of the University of New South Wales

These degrees of the University are awarded to students in the Faculty of Military Studies who qualify in the prescribed courses. The degree of Bachelor of Arts in Military Studies (BA(Mil)) applies to the Arts Course, the degree of Bachelor of Science in Military Studies (BSc(Mil)) to the Applied Science Course, and Bachelor of Engineering (BE) to the Engineering Course.

The first students were enrolled in the Faculty in 1968, and the degrees were conferred by the University for the first time in 1971.

The Diploma of Military Studies of the Royal Military College

The Royal Military College may award the Diploma of Military Studies (Dip Mil Stud) to a cadet who, having ceased to be a student in the Faculty of Military Studies, completes the prescribed military curriculum and one of the academic courses in Arts, Applied Science, or Engineering at diploma level.

The Diploma was introduced in 1968, and awarded retrospectively to graduates of the College from the previous year. The graduates of the College in 1967, 1968, 1969 and 1970 who completed their courses at the higher level were awarded the Diploma of Military Studies with Merit (Dip Mil Stud (Merit)).

Educational Qualifications for Entry to the Royal Military College in 1972

To be eligible for entry to the Royal Military College, a Candidate must satisfy the matriculation requirements of the University of New South Wales. He must also meet the faculty requirements of the Faculty of Military Studies, which are:

*for the Arts Course:*¹

English at Level 2 or higher;

OR

English at Level 3, provided that a candidate's performance in this subject and his general level of attainment are at standards acceptable to the Professorial Board, and provided that a candidate so qualified shall not enrol in a course of English literature.

for the Applied Science and Engineering Courses:

(a) Science at Level 2S or higher

AND

(b) either Mathematics at Level 2F or higher;

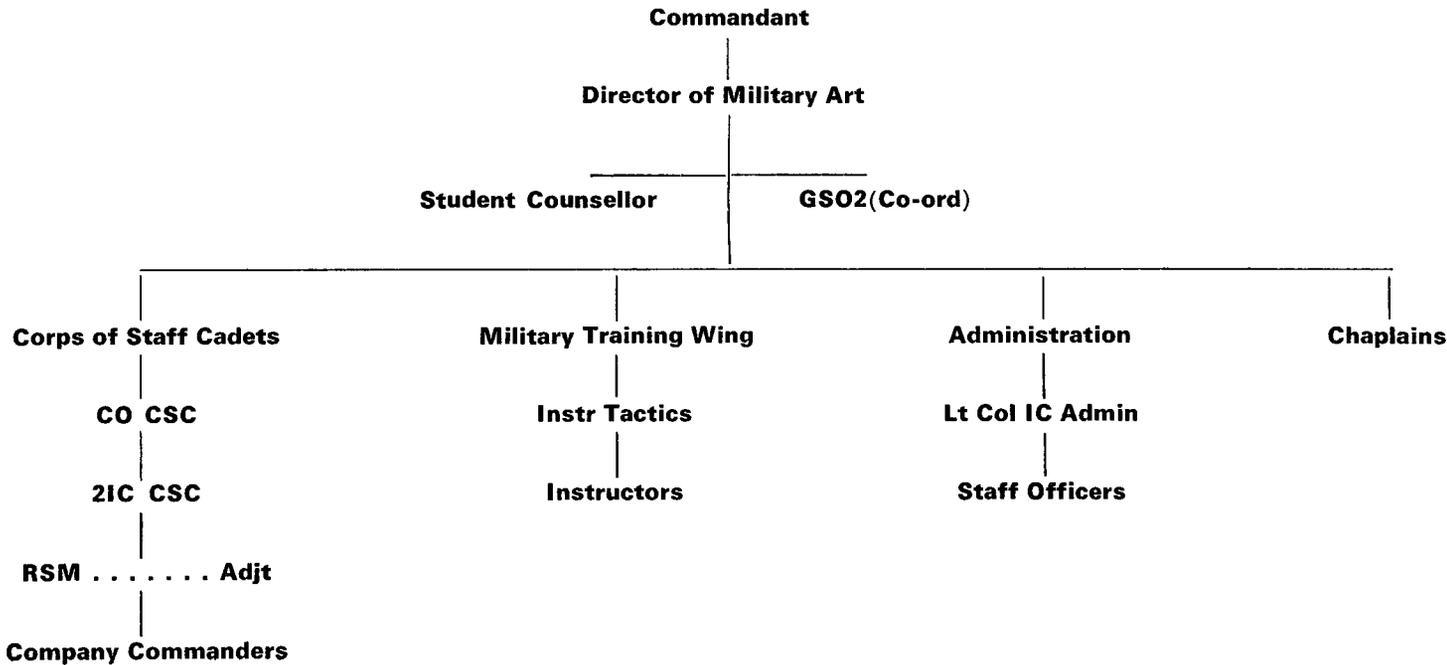
OR

Mathematics at Level 2S, provided that a candidate's performance in this subject and his general level of attainment are at standards acceptable to the Professorial Board.

¹ Candidates should be aware that the Arts Course contains a compulsory science subject requiring a knowledge of mathematics and it is therefore preferable that Arts candidates should have successfully completed at least four years of secondary school mathematics.

The Military Curriculum

OUTLINE MILITARY ORGANISATION



The Military Curriculum

Allotment of Military Periods

<i>Subject</i>	<i>Class</i>			
	<i>4</i>	<i>3</i>	<i>2</i>	<i>1</i>
Armour . . . . .	..	..	..	74
Army Health	18	..	..	13
Artillery . . . . .	..	..	..	78
Character Training	7	6	23	6
Current Affairs	13	18	19	18
Drill and Ceremonial	66	19	26	26
Infantry Minor Tactics	31	30	54	94
Leadership . . . . .	..	..	..	22
Methods of Instruction . . . . .	..	..	..	73
Military Engineering . . . . .	..	49	27	17
Military Law . . . . .	..	23	..	52
Orientation	24	..	..	..
Peace Administration . . . . .	..	..	..	70
Physical and Recreational Training	74	36	30	38
Service Etiquette	2	..	..	2
Signals . . . . .	..	28	37	22
Staff Duties, Training and Intelligence . . . . .	..	5	..	154
Tactics . . . . .	..	..	..	288
Topography	28	22	42	43
War Administration . . . . .	..	..	..	34
Weapon Training	78	71	52	116
Jungle Training Centre Course . . . . .	..	..	..	104
Reserved Periods	57	12	10	105
Total	398	319	320	1,449
Field Training	Three weeks			

Scope of Military Instruction

FOURTH CLASS

The cadet is instructed in the basic skills to bring him to a level where he will derive the maximum benefit from the Annual Field Training. He receives an introduction to other general military subjects and the importance of leadership is stressed. The first 5 weeks of the Fourth Class is devoted entirely to military work. The first 4 weeks of this period is spent in orientation training where cadets are introduced to army life. The last 2 weeks of the year are spent in the field with the remainder of the Corps of Staff Cadets.

THIRD CLASS

The cadet is brought to the standard of a trained soldier. He continues his study of general military subjects and in addition he begins training in certain aspects of arms other than infantry.

SECOND CLASS

The cadet is trained to the standard of an infantry section commander and introduced to the responsibilities of a platoon commander. More work is undertaken in general military subjects and instructional technique. The cadet continues training in certain aspects of arms other than infantry.

FIRST CLASS

Training towards the level of platoon commander continues. The cadet receives further experience in instructional technique. He continues his study of general military subjects and begins his study, at junior officer level, of Tactics and associated subjects and Peace Administration. The first class cadet is also introduced to the important Arms studies of Armour, Artillery and Signals. They undergo a course of instruction at the Jungle Training Centre and are attached to Recruit Training Battalions during the year.

Armour

<i>Class</i>	<i>Periods</i>
1	74

AIM

To give cadets the knowledge of the organisation, roles and employment of armoured units to the standard required by a junior regimental officer of an infantry battalion.

SYLLABUS

The capabilities and limitations of armoured fighting vehicles; infantry/tank co-operation, with emphasis on target indication; the organisations, characteristics and roles of armoured units. A study of troop and squadron tactics. The cadet visits RAAC units at Puckapunyal.

The combination of a formal study period, tactical exercises without troops and practical application of infantry/tank co-operation is designed to familiarise the cadet with the characteristics of armoured equipments and their tactical employment.

Army Health

<i>Class</i>	<i>Periods</i>
4	18
1	13

AIM

To instruct cadets in first aid and in the application of the principles of army health in peace and war.

SYLLABUS

Fourth Class

The cadet undergoes a first aid course and he receives lectures on personal hygiene and sanitation in the field.

First Class

Medical aspects of water supply and food supply; communicable diseases; tropical diseases and the effects of heat; management of battle casualties; responsibilities of regimental officers and medical officers for the health of troops; health lessons from past campaigns; Pulheems system of medical classification; dental health; health aspects of camps and barracks.

The course is designed to equip the cadet with the knowledge of army health required by the junior regimental officer.

Artillery

<i>Class</i>	<i>Periods</i>
1	78

AIM

To give cadets the knowledge required of a junior regimental officer in an arm other than artillery, relating to the organisation, roles and employment of artillery units in the Division and of selected units from Army Troops.

SYLLABUS

The cadet is instructed in the tactical aspects of gunnery and introduced to some practical aspects of field gunnery so that he will appreciate the capabilities and limitations of artillery.

Tactics

Organisation of artillery ; characteristics and roles of field branch artillery and its command and control, including counter battery. An outline of the components, organisation and employment of air defence artillery. The tactical employment of artillery sub-units in support of an infantry battalion, including fire planning, is taught in association with tactics.

Technical

Basic gunnery, including an appreciation of the problems at the guns and observation and control of fire. Training culminates in a four day continuous artillery exercise. Troops and equipment of the Royal Regiment of Australian Artillery form an exercise battery in which cadets fill certain executive appointments. The exercise is one of movement, deployment and firing with live ammunition.

Character Training

<i>Class</i>	<i>Periods</i>
4	7
3	6
2	23
1	6

AIM

(a) To give each cadet a foundation on which to build and strengthen his character by setting up standards and principles of conduct which will make it possible for him to grapple with the problems and difficulties of service life.

(b) To assist each cadet to develop those qualities of leadership required for his profession.

SYLLABUS

The syllabus is designed to foster a more mature understanding of and the practical application of basic religious principles. It is necessarily flexible and may be varied from time to time.

Basic instruction is designed to assist the cadet to adjust himself to his new environment, and to encourage him in the continued practice of his religion. Further instruction is designed to instil in the cadet a sense of moral responsibility and to encourage him to maintain and develop his personal qualities.

The Second Class is given a specialised Character Training Course based on the Ten Commandments as a way of life.

Current Affairs

<i>Class</i>	<i>Periods</i>
4	13
3	18
2	19
1	18

AIM

To assist the cadet to understand the background to current events throughout the world, especially in those areas of interest to Australia, and to develop by discussion and debate, the cadet's own thoughts about current defence problems.

SYLLABUS

Fourth Class

Indo-China—the political, social and economic history and current situation. Debates on current situations.

Third Class

Thailand, Malaysia—the political, social and economic history and current situations. Debates on current situations.

Second Class

Indonesia, New Guinea—the political, social and economic history and current situation. Debates on current situations.

First Class

Japan—the political, social and economic history and current situation. Debates on current situations.

Drill and Ceremonial

<i>Class</i>	<i>Periods</i>
4	66
3	19
2	26
1	26

AIM

To ensure that a high standard of drill is achieved by individual cadets and by the Corps and that each cadet on graduation is competent to perform the duties of a regimental officer with respect to drill instruction and ceremonial parades.

SYLLABUS

Fourth Class

Squad drill with and without arms, words of command, compliments, sentry drill, platoon drill, guards of honour, cane drill, funeral exercises with the rifle, elementary ceremonial, participation in ceremonial parades.

Third Class

Revision of the instruction in the Fourth Class, guards and sentries, words of command, exercising squads, company drill, participation in ceremonial parades.

Second Class

Revision of previous instruction, company drill, advanced ceremonial rifle, colour and sword drill, participation in ceremonial parades.

First Class

Revision of the more advanced drill. Lectures on advanced ceremonial. Honours and salutes, flags and flag stations, guards of honour, street lining, military bands, *feu de joie*, administrative instructions for ceremonial parades. Participation in ceremonial parades.

Infantry Minor Tactics

<i>Class</i>	<i>Periods</i>
4	31
3	30
2	54
1	94

AIM

First Class course at JTC

To teach the cadet the minor tactics, skills and techniques required to command an infantry platoon.

SYLLABUS

Organisation of an infantry platoon. Use of weapons and equipments under field conditions.

The instruction is conducted in the field and is confirmed by the cadets participation in the annual training exercise.

Battle procedure. Employment of an infantry platoon in the attack, defence and withdrawal phases of war. Patrolling, Counter Revolutionary operations. Exercises are conducted to confirm all minor tactics training and to practise cadets in the command of sections, platoons and patrols.

Three weeks are spent at the Jungle Training Centre, Canungra, where cadets learn jungle warfare technique; contact/ambush drills, counter MT ambush, harbouring, section and platoon attacks, patrolling, village cordon and search, withdrawal.

First Class cadets are employed to command and instruct the junior classes during the first week of the annual training exercise.

Leadership

Class 1 *Periods* 22

AIM

To develop the qualities of leadership which are essential in a regimental officer and to prepare a cadet for the problems he will encounter in leading men, especially during his early commissioned service.

SYLLABUS

The meaning of leadership; the characteristics which make a good leader.

Practical problems which a young officer may encounter in leading a group of men, and their possible solutions. Soldiering in a regular unit; morale; courage; liberty and discipline; the day to day duties and responsibilities of a junior regimental officer.

Methods of Instruction

Class 1 *Periods* 73

AIM

To introduce the cadet to the techniques of Instruction and to provide him with the practical knowledge of this subject required by a junior regimental officer.

The Military Curriculum

SYLLABUS

The cadet is introduced to the theoretical and practical aspects of instruction. In addition he participates in a Communication and Thinking series which includes the art of public speaking and debating.

- (a) The five stages of instruction.
- (b) The science of instruction.
- (c) Preparation of the syllabus and training programme.
- (d) Medium of instruction.
- (e) Assessment.
- (f) Training aids.
- (g) Communication and thinking skills.
- (h) Mutual instruction.

Military Engineering

<i>Class</i>	<i>Periods</i>
3	49
2	27
1	17

AIM

To make the cadet proficient in those aspects of military engineering required by a junior regimental officer in any arm.

SYLLABUS

Third Class

Use, operation and maintenance of assault boats with and without outboard motors and related topics. Knots and lashings; construction of an aerial rope-way. Construction of improvised tracks and beach heads.

Second Class

Revision of current mines and mechanisms; mine laying drills; mine field breaching; reconnaissance planning and management of engineer tasks.

First Class

Organisation, characteristics and roles of the divisional engineers; employment of engineers; engineer operations. Theory of explosives; service explosives and accessories; firing small charges; battle noise simulation; safety.

In addition the cadet attends a one week course at the School of Military Engineering which covers: mine warfare and booby-traps, the theory of explosives and services explosives and accessories, firing of small charges, safety, tunnel warfare, a demonstration of current engineer plant and a demonstration of current gap-crossing equipment and an introduction to NBC warfare.

Military Law

<i>Class</i>	<i>Periods</i>
3	23
1	52

AIM

To instruct the cadet in the principles of military law, and to provide him with the practical knowledge of this subject required by a junior officer.

SYLLABUS

Third Class

The cadet is instructed on the foundations and principles of military law, its application and administration within the College. Subjects include: offences, evidence, summary punishments, redress of wrongs, courts of enquiry and boards.

First Class

Courts martial procedure; National Service Act; Geneva Convention; Visiting Forces Act; International Law.

Orientation

<i>Class</i>	<i>Periods</i>
4	24

AIM

To introduce the new entry cadet to those traditions, customs and administrative procedures which will assist him in taking his place as a member of the Corps of Staff Cadets.

SYLLABUS

History, traditions, customs and outline organisations of the Army and the Royal Military College; Administrative procedures; Routine at the College; Ranks of the three services; the CSC Mess and Introduction to Canberra.

The course is designed to assist in the cadets' transition into the environment at the Royal Military College. The instruction is completed prior to the commencement of the academic year.

Peace Administration

<i>Class</i>	<i>Periods</i>
1	70

AIM

The aim of Peace Administration is to instruct, and practise cadets in those aspects of administration which will concern them as junior regimental officers.

Duties and Responsibilities of Unit Staffs

'A' Administration. Introduction to peace administration, personnel accounting, enlistment of recruits, disposal of recruits, regimental and personal documents, group classification system, reposting, transfer, JOBEX, promotion-officers, promotions, leave, movements, removals, discharge, re-engagement, investigations, illegal absentees, resettlement, medical documentation, AUSDIL and NOTICAS, investigations, injuries, AHBS, CARO, DFRBF, welfare policy, organisations, morale, educational, medical, physical and recreational, hire purchase, recruiting, National Service Act, officers' and sergeants' messes, PMF pay system, pay and allowances, pay procedure, military finance and wills.

'Q' Administration. Barrack maintenance, RAASC supplies-transport and POL, stores accounting-introduction, documents and forms, unit stores account, issue, write off, transfer, E2, E2C accounting, investigations, boards of survey, internal 'Q' checking, internal 'A' checking, ammo accounting, stocktake and spot checks, stocktake exercise, security, duties of orderly officer, 'Q' preparations for exercises, operations of unit orderly room, 'Q' preparation for overseas service.

Unit Finance. The bookkeeping of mess monies, unit public monies and regimental funds.

New Zealand cadets receive separate instruction.

Physical and Recreational Training

<i>Class</i>	<i>Periods</i>
4	74
3	36
2	30
1	38

AIM

Physical Training at RMC is designed:

- (a) To bring all cadets to a high standard of physical fitness in the first training year.
- (b) To maintain a high standard of 'all round' physical fitness and develop purposeful military skills progressively through the remaining three years of the course
- (c) To give cadets a wide basic knowledge of physical and recreational training so that they are prepared on graduation to perform the duties of a regimental officer in this regard.

SYLLABUS

Fourth Class

Recruit physical training, gymnastics, swimming instruction, minor team games, endurance training, obstacle course training, weight and circuit training, basic boxing instruction and testing in all subjects

Third Class

Battle physical training, gymnastics, swimming instruction, obstacle course training, minor team games and potted sports, end of term tests and weight and circuit training.

Second Class

Battle physical training, gymnastics, swimming instruction, obstacle and endurance training, lectures, theory and application of physical training and sports organisation, close combat and end of term tests.

First Class

Battle physical training, gymnastics, physical training theory, sports organisation, obstacle and endurance training, swimming instruction, close combat, end of term tests and Battle PT tests.

Service Etiquette

<i>Class</i>	<i>Periods</i>
4	2
1	2

AIM

To instruct cadets on those points of manners and etiquette which make for ease and pleasantness in any company, and to make them familiar with mess customs and procedures.

SYLLABUS

The syllabus is designed to make cadets aware of their social responsibilities both within and outside of the service.

Fourth Class

Dinner table etiquette; methods of address; rules for introductions; social obligations; correspondence, customs of the service.

First Class

Mess customs and procedures, social correspondence.

Signals

<i>Class</i>	<i>Periods</i>
3	28
2	37
1	22

AIM

- (a) To teach the skills and techniques of signalling required by a junior regimental officer.
- (b) To teach the organisation, roles and employment of Signals units within the division to the level required of a junior regimental officer in any other Arm or Service.

SYLLABUS

Third Class

Instruction in and operation of the PRC-F1 and the AN/PRC-25. Instruction in and practice of radio-telephone procedure for users.

Second Class

Revision and further instruction on the characteristics and operation of the PRC-F1, GRC-F2, AN/PRC-64, AN/PRC-25 and AN/GRC-125.

Instruction on and practical experience in the operation of the VHF retransmission kit, remote control and direction finding equipment.

Instruction in the propagation of HF and VHF radio waves and antenna systems leading to the resultant choice of equipment, antenna, frequency and site for a given task. Instruction and practical experience in the installation, operation and maintenance of basic field telephone systems, including the operation of man-portable telephone switchboards and the location and repair of line faults.

Brief revision in radio-telephone procedure and instruction in the use of the current radio-telephone codes.

First Class

Organisation of the Royal Australian Corps of Signals. The responsibilities of Signals. The principles and means of communications. Electronic Warfare and Communications Security. Communications in tropical areas. Organisation of the divisional signals regiment, task force signal squadron and tactical air support signal squadron. In addition signals aspects of tactical problems are included in Tactics. A brief introduction to the mechanics of signals centre operation is given.

Staff Duties, Training and Intelligence	<i>Class</i>	<i>Periods</i>
	3	5
	1	154

AIM

To provide the cadet with sufficient knowledge of Staff Duties, Training and Intelligence to fit him for a junior regimental appointment on graduation and to prepare him for a subsequent junior staff appointment.

SYLLABUS

Third Class

An introduction to the organisation of the Australian Military Forces. Introduction to service writing.

First Class

Organisations within the division; service writing; orders and instructions; appreciation and decision making; operational staff work; intelligence organisations and procedures; the preparation and conduct of various types of training exercises; road movement.

Tactics	<i>Class</i>	<i>Periods</i>
	1	288

AIM

To provide the cadet with the technical knowledge required by a junior regimental officer in an infantry battalion and an appreciation of the all arms aspects of modern warfare.

SYLLABUS

The detailed organisation of an infantry battalion, its characteristics and roles; and introduction to tactics; enemy organisations and tactics; battle procedure and deployment; attack; defence; withdrawal; advance and counter-revolutionary operations; tropical warfare; other specialised techniques; field training covering all phases of war, in which the First Class cadets fill the key appointments in a battalion group organisation.

Topography	<i>Class</i>	<i>Periods</i>
	4	28
	3	22
	2	42
	1	43

AIM

To teach and practise the cadet in :

- (a) The principles of map and air photo reading.
- (b) Position finding and navigation by day and night in open and close country.

The Military Curriculum

SYLLABUS

Fourth Class

Introduction to map reading, the use of a map, grid references and north points, the service protractor, conversion of bearings, the prismatic compass, relief and its representation, gradients, inter-visibility, orientation and position finding.

Third Class

Revision of the Fourth Class syllabus; navigation exercises by day and night; position finding; map and ground comparison.

Second Class

Preparation and use of Navigational Data Sheets; route planning; position finding; map and ground comparison. Instruction is confirmed in a reconnaissance patrol exercise conducted in difficult terrain by day and night.

War Administration

<i>Class</i>	<i>Periods</i>
1	34

AIM

- (a) To give the cadet an understanding of maintenance in the field and the functions of the major services as they affect the tactical handling of an infantry battalion.

SYLLABUS

Principles of administration; administration in the infantry battalion. Administration within the division—supplies and transport, medical, ordnance, repair and recovery and miscellaneous services; administration in a tropical theatre of operations; supply and movement by air. In addition to the periods shown, a number of Tactics periods are devoted to the application of administrative knowledge to the indoor and outdoor exercises.

Weapon Training

<i>Class</i>	<i>Periods</i>
4	78
3	71
2	52
1	116

AIM

- (a) To make the cadet proficient in the use of the weapons of a rifle company and to give him a general knowledge of the weapons of the support company and their tactical employment.
- (b) To give the cadet the knowledge and experience on all aspects of the organisation of Weapon Training and conduct of range practices necessary for a junior regimental officer.

SYLLABUS

Fourth Class

Weapons; self-loading rifle, automatic rifle, general purpose machine gun, sub-machine gun and grenades. Fieldcraft and target detection. Range practices to qualify at the Recruit Qualification Practice.

Third Class

Weapons; revision on self-loading rifle, general purpose machine gun, sub-machine gun and grenades. Instruction and field firing of the launcher grenade, light anti-tank weapon and an introduction to the M16 rifle. Annual range qualification at the Recruit Qualification Practice. Instruction and live firing of the fragmentation, white phosphorus and smoke grenades.

Second Class

Weapons; revision on self-loading rifle, general purpose machine gun, sub-machine gun, grenade launcher and light and medium anti-tank weapon. Service pistol; revision of grenades; annual range qualification at the Recruit Qualification Practice; introduction to night firing and continues his instruction in field craft.

First Class

The medium mortar; organisation and employment of the mortar platoon, characteristics of mortar fire, communications in battle, fire orders and command post procedure. Battle shot weapon training is completed with sneaker course, battle practice night shooting and section firing practice. During the year cadets are required to organise and conduct range practices using all rifle company weapons.

Field Training

AIM

The aim of field training is to exercise cadets under simulated operational conditions over a prolonged period.

SYLLABUS

General

Field training is conducted in two phases:

- Phase 1. Preparatory phase for one week comprising section, platoon and company training, under First Class supervision.
- Phase 2. Field exercise with cadet appointments comparative to their standard of training. This exercise is of two week's duration and covers all major phases of war.

Fourth Class

The class is exercised at recruit soldier standard. All phases of war are covered with the cadet taking part as a reinforcement soldier trained to recruit level.

Third Class

The class is exercised at trained soldier standard. All phases of war are covered with the cadet taking part as a trained soldier with particular responsibilities for sponsoring the cadets of the Fourth Class.

Second Class

The cadets are exercised at section commander level.

Depending upon his posting the Second Class cadet is exercised as section leader, specialist platoon detachment leader, signalman, clerk, etc. Thus he is given considerable insight into the workings of a battalion under operational conditions.

First Class

The class is exercised essentially at platoon commander level, but as far as possible each cadet is given an officer non-commissioned officer posting in a position most appropriate to his allocated corps on graduation. All phases of war are covered with particular emphasis being placed on leadership and command, and problems are posed that require the practical application of all military studies covered during the four-year course. As a preliminary to the annual field training exercise, the First Class cadets are exercised in a signals or headquarters exercise at battalion/company level.

**Courses For The Degrees of
Bachelor of Arts in Military Studies,
Bachelor of Science in Military Studies and
Bachelor of Engineering in the Faculty
of Military Studies of the University of
New South Wales**

The University of New South Wales

Faculty of Military Studies

Its 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 ten 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) and, recently, 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 Military Training, certain of the Heads of Schools at the University whose disciplines are relevant, the Registrar of the University *ex officio*, such other persons with appropriate qualifications as the Council may appoint (these include the Commanding Officer, Corps of Staff Cadets, and the company commanders), and three 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; he presides at the meetings of Faculty and its committees.

The Faculty supervises teaching and examining in the subjects for which it is responsible, and it is concerned with all matters associated with these tasks. 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 three 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 Commandant, the Director of Military Art, the Heads of Departments at Duntroon, four of the members from Kensington, namely the Pro-Vice-Chancellor and three Heads of Schools, the Registrar of the University *ex officio*, the Faculty Secretary, and certain elected members. 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 the Faculty, the Dean, all Professors who are members of Faculty, the Registrar of the University *ex officio*, and six members elected by Faculty. It usually meets twice 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, the Director of Military Art, the Heads of Departments at Duntroon, the Heads of Schools who are members of Faculty, the Registrar of the University *ex officio*, and the Faculty Secretary. The committee reviews the annual and deferred 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.

Faculty of Military Studies

Dean

Professor B. D. BEDDIE, BA *Syd.*, PhD *Lond.*

Chairman

Professor J. C. BURNS, MSc *N.Z.*, BA *Cantab.*, PhD *Manc.*

Faculty Secretary

R. W. O. PUGH, BE *Syd.*, BA *A.N.U.*, MIEAust, MACE, psc

The Faculty comprises the professors, associate professors, senior lecturers and lecturers at Duntroon, plus the following members of the College *ex officio*:

the Commandant,
the Director of Military Art,
the Commanding Officer, Corps of Staff Cadets,
the General Staff Officer 2 (Co-ordination),
the Second-in-Command and Company Commanders of the
Corps of Staff Cadets,
the Librarian, and
three student members elected by the students in the Faculty ;
the Director of Military Training, Army Headquarters; and the
following members of the University of New South Wales
at Kensington :

Professor F. W. AYSCOUGH, BSc *Syd.*, MSc *N.S.W.*, CEng,
MChemE, ARACI

Head, School of Chemical Technology

Professor R. A. A. BRYANT, ME *N.S.W.*, ASTC, CEng, FIMechE,
MIEAust, AFRAeS

Head, School of Mechanical and Industrial Engineering

Professor V. T. BUCHWALD, BSc *Manc.*, MSc PhD *Lond.*

Head, School of Mathematics

Professor G. W. K. CAVILL, MSc *Syd.*, PhD DSc *Liv.*, FAA,
FRIC, FRACI,

Head, School of Chemistry.

Professor F. K. CROWLEY, MA PhD *Melb.*, DPhil *Oxon.*

Head, School of History

Professor E. P. GEORGE, BSc PhD *Lond.*, DSc *N.S.W.*, FlInstP,

Head, School of Physics

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.*, AIM, MAusIMM,

Head, School of Metallurgy

Professor J. W. NEVILLE, BA *W.Aust.*, MA PhD *Calif.*
Head, School of Economics

Professor H. J. OLIVER, MA *Syd.*
Head, School of English

Professor H. R. VALLENTINE, BE *Syd.*, MS *Iowa*, ASTC,
MIEAust, MASCE,
Head, School of Civil Engineering

Professor A. H. WILLIS, DSc(Eng) *Lond.*, CEng, MIMechE,
MIEAust, MemASAE, WhSc,
Pro-Vice-Chancellor

Mr D. C. VALLENTINE, BEc *Syd.*, AASA,
Associate Registrar (representing the Registrar)

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 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 Engineering: Hood of old gold silk edged with light maroon silk.
(BCC 36 Light Maroon)

Faculty of Military Studies

Rules governing the award of the degree of Bachelor of Arts in Military Studies

These rules apply to all students who enrol as first year students in 1971 or in subsequent years and, in respect of Rule 4, to students who enrol as third-year students in 1971 and 1972.

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 Clauses, 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 may not enrol in Course II of a subject until he has completed Course I of that subject; and a candidate may not enrol in Course III of a subject until he has completed Course II of that subject, except that a candidate who has completed Government I and History I and History II may enrol in Government III.
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 Clause 7, and the military requirements of the degree, as specified in Clause 8.
6. The academic requirements specified in Clause 7 shall be completed over the first three years of the candidate's course and the military requirements specified in Clause 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 a candidate in which to complete either or both of the academic and military requirements.
7. *Academic Requirements*—The following qualifying courses shall be completed:
 - (a) The course English Language, and the two courses History I and History II, as specified in Schedule A1.

- (b) One of the courses specified in Schedule A2.
- (c) Six of the courses specified in Schedule A3 so chosen as to constitute either
 - (i) Courses I, II and III of each of two subjects,
or
 - (ii) Courses I, II and III of one subject
and
Course I and II of one other subject
and
Course I of a third subject ;
OR, ALTERNATIVELY:

The course History III as specified in Schedule A1, and five of the courses specified in Schedule A3 so chosen as to constitute either

- (i) Courses I, II and III of one subject
and
Courses I and II of one other subject,
- (ii) Courses I and II of each of two subjects
and
Course I of one other subject.

Subject to his complying with Rule 4, a candidate who completes Government I and Government III will be deemed to have completed Courses I and II of one subject within the provisions of Rule 7 (c).

8. *Military Requirements*—A candidate shall complete the programme 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 Clauses 3, 4 and 7 above, provided that any proposed variation shall be initiated by a recommendation from a Head of Department concerned.

SCHEDULE A1

<i>Subject</i>					<i>Course</i>
English	.	.	.	.	1551 English Language
History	.	.	.	.	1405 History I
					2407 History II
					3407 History III

SCHEDULE A2

<i>Subject</i>	<i>Course</i>
Chemistry	1305 Chemistry I
Physics	1203 Physics I
Science	1805 Science IA

SCHEDULE A3

<i>Subject</i>	<i>Course</i>
Economics	1609 Economics I
	2607 Economics II
	3609 Economics III
English	1507 English I
	2507 English II
	3507 English III
Geography	1651 Geography I
	2653 Geography II
	3651 Geography III
Government	1625 Government I
	2625 Government II
	3627 Government III
Mathematics	1103 Mathematics I
	2113 Mathematics II
	3113 Mathematics III

Programmes of study for the degree of BA (Mil)

First Year (Fourth Class)

All candidates take History I, a Science unit, and Course I of two of the following subjects : Economics, English, Geography, Government, Mathematics.

Second Year (Third Class)

All candidates take History II, English Language and Course II of one of the subjects begun in First Year. In addition they have the choice of

- either* (a) Course II of the other subject begun in First Year
- or* (b) Course I of another subject.

Third Year (Second Class)

All candidates have the choice of

- (a) Course III of two subjects done in the previous two years;¹
- or* (b) Course III of a subject done in the previous two years together with Course II of a subject previously begun ;
- or* (c) Course III of a subject done in the previous two years together with Course I of another subject.

¹ Government III may be taken by students who have completed Government I and II or Government I and History I and II.

Rules governing the award of the 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 Clauses, 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 may not enrol in Course II of a subject until he has completed Course I of that subject; and a candidate may not enrol in Course III of a subject until he has completed Course II of that subject.
5. 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 Clause 7, and the military requirements of the degree, as specified in Clause 8.
6. The academic requirements specified in Clause 7 shall be completed over the first three years of the candidate's course and the military requirements specified in Clause 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 a candidate in which to complete either or both of the academic and military requirements.
7. *Academic Requirements.* The following qualifying courses shall be completed:
 - (a) The courses English A, English B and History C, as specified in Schedule S1.
 - (b) The courses Chemistry I, Chemistry II, Mathematics I, Mathematics II, Physics I, and Physics II, as specified in Schedule S2.
 - (c) One of the courses Chemistry III, Mathematics III and Physics III, as specified in Schedule S2.

(d) One or two of the courses specified in Schedule S3, to provide a third year combination with the course elected as specified in Clause 7 (c); this combination, which must be approved by the Dean of the Faculty, may consist of:

- (i) Chemistry III and Mathematics IIIA
or Chemistry III and Physics IIIA
or Chemistry III and Mathematics IIIB and Physics IIIB

OR

- (ii) Mathematics III and Chemistry IIIA
or Mathematics III and Physics IIIA
or Mathematics III and Chemistry IIIB and Physics IIIB

OR

- (iii) Physics III and Chemistry IIIA
or Physics III and Mathematics IIIA
or Physics III and Chemistry IIIB and Mathematics IIIB

8. *Military Requirements*—A candidate shall complete the programme 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 Clauses 3, 4 and 7 above, provided that any proposed variation shall be initiated by a recommendation from a Head of Department concerned.

SCHEDULE S1

<i>Subject</i>	<i>Course</i>
English	1521 English A 2521 English B
History	1413 History C

SCHEDULE S2

<i>Subject</i>	<i>Course</i>
Chemistry	1305 Chemistry I 2303 Chemistry II 3303 Chemistry III
Mathematics	1105 Mathematics I 2103 Mathematics II 3103 Mathematics III
Physics	1203 Physics I 2203 Physics II 3203 Physics III

Degree Rules and Programmes of Study

SCHEDULE S3

<i>Subject</i>	<i>Course</i>
Chemistry	3303A Chemistry IIIA 3303B Chemistry IIIB
Mathematics	3103A Mathematics IIIA 3103B Mathematics IIIB
Physics	3203A Physics IIIA 3203B Physics IIIB

Programme of Study for the Degree of BSc (Mil)

APPLIED SCIENCE COURSE

Year I

Chemistry I
Mathematics I
Physics I
History C

Year II

Chemistry II
Mathematics II
Physics II
English A

Year III

Chemistry III and Mathematics IIIA
or Chemistry III and Physics IIIA
or Chemistry III and Mathematics IIIB and Physics IIIB

OR

Mathematics III and Chemistry IIIA
or Mathematics III and Physics IIIA
or Mathematics III and Chemistry IIIB and Physics IIIB

OR

Physics III and Chemistry IIIA
or Physics III and Mathematics IIIA
or Physics III and Chemistry IIIB and Mathematics IIIB

and

English B

**Rules governing the award of the degree
of Bachelor of Engineering
in the Faculty of Military Studies**

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 Clauses, 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;
- (b) Perform satisfactorily in such exercises, laboratory, drawing offices and field work, essays and thesis (if any), and visits to industry or other demonstrations or excursions as may be prescribed in that subject; and
- (c) Pass the examination or examinations in that subject.

4. A candidate shall be required to complete all the subjects prescribed in a year of the course before his enrolment will be accepted for any subject prescribed in a later year of the course.

5. A candidate shall be required to complete both the academic requirements of the degree, as specified in Clause 7, and the military requirements of the degree, as specified in Clause 8.

6. A candidate shall be required to complete all academic and military requirements in not more than 5 years.

7. *Academic Requirements*—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.

8. *Military Requirements*—The candidate shall follow the prescribed Schedule ME of military work and show that he has attained the required standards.

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

Degree Rules and Programmes of Study

SCHEDULE E1—The First Year Course

All Engineering Students

- 1105 Mathematics I
- 1203 Physics I
- 1303 Chemistry
- 1707 Engineering I
- 1521 English A *or* General Studies

SCHEDULE E2—The Second Year Course

All Engineering Students

- 2715 Technical Communication

Civil Engineering

- 2175 Mathematics IIE
- 2717 Engineering II
- 2725 Civil Engineering I

Mechanical Engineering

- 2175 Mathematics IIE
- 2717 Engineering II
- 2767 Mechanical Engineering I

Electrical Engineering

- 2103 Mathematics II
- 2273 Physics II
- 2745 Electrical Engineering I

SCHEDULE E3—The Third Year Course

All Engineering Students

- 1413 History C Part I *or* 1413 History C Part II

Civil Engineering

- 3171 Mathematics IIIE
- 3743 Electrical Technology
- 3761 Applied Thermodynamics
- 3729 Structures I
- 3731 Civil Engineering II

Mechanical Engineering

- 3171 Mathematics IIIE
- 3743 Electrical Technology
- 3771 Mechanical Engineering II

Electrical Engineering

- 3141 Mathematics IIIE
- 3747 Electrical Engineering II
- 3761 Applied Thermodynamics

SCHEDULE E4—The Fourth Year Course

All Engineering Students

1413 History C Part II *or* 1413 History C Part I

4705 Management Science

4703 Project and Thesis

Civil Engineering

4721 Structures II

4723 Civil Engineering III

Mechanical Engineering

4761 Mechanical Engineering III

Electrical Engineering

4741 Electrical Engineering III

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 programme of training in the subjects listed under the broad headings of Military Art, Military Science and Military Technology and the programme shall extend over four years.

2. During each of the first three years, the requirements of the programme shall, in the main, be completed in a four-week period prior to the commencement of the academic year and in a three-week period after the end of that academic year. Physical education and military drills, however, shall extend over the whole of these four and three weeks periods and the 30 week academic year.

3. The fourth year shall be devoted entirely to the military training programme and shall extend over a period of 44 weeks.

4. The individual subjects contained in the programme 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 logistical 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, fire power 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 degree of Bachelor of Engineering in the Faculty of Military Studies

SCHEDULE ME

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

2. During each of the four years, the main requirements of the programme 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 programme 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 logistical 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, fire power of current Army weapons.

Subjects offered by the Faculty of Military Studies

The courses detailed in the pages that follow are grouped under the Departments in the Faculty of Military Studies, namely:

Chemistry
Engineering
Government and Economics
History
Language & Literature
Mathematics
Physics.

Each course is given an index number of four figures. The first figure indicates the year in which the course is first presented. The second indicates the Department responsible for the course: 1—Mathematics, 2—Physics, 3—Chemistry, 4—History, 5—Language & Literature, 6—Government and Economics, 7—Engineering; 8 is used for *Science IA*, which is presented jointly by Physics and Chemistry. The third and fourth figures are serial numbers allotted by the Department concerned.

Department of Chemistry

1303 Chemistry

Lectures 30 hr
Laboratory 30 hr

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

Heats 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.

RECOMMENDED TEXTS

Sisler, Van der Werf & Davidson, *College Chemistry*, Macmillan, 1967.

Depuy & Rinehart, *Introduction to Organic Chemistry*, Wiley, 1967.

1305 Chemistry I

Lectures 84 hr
Tutorial 28 hr
Laboratory 84 hr

LECTURE COURSE

(a) Atomic and Molecular Structure

Sub-atomic particles; electron arrangements in atoms and the periodic classification; molecular and crystal structure; property-structure relationships.

(b) Periodic Classification

Comparative chemistry of selected groups of elements.

(c) Stoichiometry and Thermochemistry

The mole concept; measures of concentration; conservation laws; redox reactions; heat of reaction; heat of formation; bond energies; activation energy.

(d) *Chemical Equilibrium*

Qualitative and quantitative aspects of reversible reactions; ionisation constants; pH; acid-base indicators, titration curves; buffer solutions; formation constants; solubility products.

(e) *Electrochemistry*

Voltaic cells; electrode potentials; commercial batteries; redox titrations. Electrolysis reactions; factors which determine the discharge of ions.

(f) *Phase Equilibria*

Changes of state; vapour pressure; critical phenomena; colligative properties; types of solutions.

(g) *Organic Chemistry*

An introduction to the chemistry of aliphatic and aromatic hydrocarbons and their simple halide, oxygen and nitrogen derivatives.

LABORATORY COURSE

Exercises introducing chemical techniques and supplementing the lecture course.

RECOMMENDED TEXTS

Sisler, Van der Werf and Davidson, *College Chemistry*, Macmillan, 1967.

Schaum, *Theory and Problems of College Chemistry*, 5th ed., Schaum Publishing Co., 1966.

Barrow et al, *Understanding Chemistry*, Benjamin, 1967.

Aylward and Findlay (ed.), *Chemical Data Book*, 2nd ed., Wiley, 1966.

Morrison and Boyd, *Organic Chemistry*, 2nd ed., Allyn and Bacon, 1966.

Banks, *Naming Organic Compounds*, Saunders, 1967.

2303 Chemistry II

	Terms		
	I	II	III
Lectures	4	3	2
Laboratory	4	5	6

LECTURE COURSE

(a) *Crystal and molecular structure*

Crystallography of ionic compounds and metals; stereochemistry of covalent compounds; coordination compounds and ligand-field theory.

(b) *Thermodynamics*

Concepts of enthalpy, entropy, free energy, equilibrium constant, chemical potential and activity, and their applications to changes of state, solutions, phase equilibria and chemical equilibria.

(c) *Electrochemistry*

Thermodynamics of electrode processes; electrolytic conductance.

(d) *Inorganic chemistry*

Chemistry of the transition elements and selected groups.

(e) *Instrumental analysis*

Principles and applications of absorption, atomic emission and atomic absorption spectrophotometry; fluorescence; potentiometry; conductimetry; polarography.

(f) *Organic chemistry*

Synthesis and reactions of aliphatic and aromatic compounds; stereochemistry; mechanisms of organic reactions.

RECOMMENDED TEXTS

Moore, *Physical Chemistry*. 4th ed., Longmans, 1963.

Morrison and Boyd, *Organic Chemistry*. 2nd ed., Allyn and Bacon, 1966.

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

Addison, *Structural Principles in Inorganic Compounds*. Longmans, 1961.

Shriner, Fuson and Curtin, *Systematic Identification of Organic Compounds*. 5th ed., Wiley, 1964.

Pecsok & Shields, *Modern Methods of Chemical Analysis*, Wiley, 1968.

3303 Chemistry III

Lecture	140 hr
Laboratory	336 hr
	<hr/>
	476 hr
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OUTLINE OF COURSE

Topics amounting to *twelve units* will be selected from the following list. Topics (a)–(d) and Topic (o) count as *two* units each, and the remainder as *one* unit each.

- (a) Physical methods of structure determination.
- (b) Macromolecules.
- (c) Food and toxic substances.
- (d) Explosives, explosions, combustion and detonation.
- (e) Electrochemical cells.
- (f) Corrosion.
- (g) Surface chemistry.
- (h) Chromatography.
- (i) Chemical kinetics and reaction mechanisms.
- (j) Inorganic chemistry.
- (k) Nuclear fuels.
- (l) Organic chemistry
- (m) Chemical fuels.
- (n) Radiochemistry.
- (o) Computing techniques.

3303A Chemistry IIIA

OUTLINE OF COURSE

Topics amounting to *four units* will be selected from the list appearing under 3303 Chemistry III.

3303B Chemistry IIIB

OUTLINE OF COURSE

Topics amounting to *one, two or three units* (depending on the number of units selected from 3103B Mathematics IIIB and 3203B Physics IIIB) will be selected from the list appearing under 3303 Chemistry III.

Department of Engineering

1707 Engineering I

<i>Lecture</i>	66 hr
<i>Drawing Office</i>	50 hr
<i>Shop Work</i>	50 hr
<i>Laboratory and Tutorial Work</i>	40 hr
	<hr/>
	206 hr
	<hr/>

SCOPE

An introduction to the principles of engineering mechanics and to the principles and practice of engineering drawing and technology for cadets commencing the study of engineering.

SYLLABUS

Introduction to Technology

The present day scope of engineering viewed against its historical background especially in Australia.

The organisation of the profession of engineering. (A visit is made to the Snowy Mountains Hydro-Electric Authority or other major engineering organisation.)

The departments of a manufacturing organisation, and their inter-relation.

The production in Australia and properties of iron, steel and the common non-ferrous metals.

The principles of pattern-making, foundry work, metal machining, workshop measurement and gauging.

Engineering Mechanics

Forces, classification of force systems. Composition and resolution of force systems. Principles of equilibrium; analytic solutions. Centroids, centre of gravity of geometric figures. Second moment of area, moment of inertia, product of inertia. Work, mechanical advantage, velocity ratio, efficiency. Laws of dry friction, wrapping friction. Kinematics of the plane motion of a particle, of systems of particles and of rigid bodies. Kinetics of the plane motion of a particle, of systems of particles and of rigid bodies: equations of motion, dynamic equilibrium, work, energy, power, impulse and momentum.

Laboratory and Tutorial Work

Introduction to measurement and problem solving in engineering units: simple machines, reactions and elastic deflection of beams, shafts in torsion, forces in pin jointed frames. Simple materials testing and calculation of stresses. (Slide rules and instruction books will be issued.)

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.

TEXTBOOKS *

- Beer, F. P. and Johnson, E. R. J., *Mechanics for Engineers*, combined volume 2nd ed., McGraw-Hill 1962.
- Beaumont, R. A., *Mechanical Testing of Metallic Materials*, 3rd ed., Pitman 1963.
- Begeman, M. L., and Amstead, B. H., *Manufacturing Processes*, 5th ed., Wiley 1963.
- Mills, A. P., Hayward, H. W. and Rader, L. F., *Materials of Construction*, 6th ed., Wiley 1955.
- Hoelscher, R. P., and Springer, C. H., *Engineering Drawing and Geometry*, 2nd ed., Wiley, 1963.

2715 Technical Communication

Lecture 28 hr

SYLLABUS

A review of written, oral, and graphical methods of conveying information in relation to the nature of the topic. Preparation of written reports and techniques of public speaking. Chairmanship. Drawing as a means of communication. Pictorial sketches and drawings as illustrations, instructions and visual aids. Basic photographic techniques. The grammar of cine film and television. Library searching, collation of material, systems of information retrieval, computerised data storage. Presenting a seminar lecture. Precis writing. Submission of a technical report.

TEXTBOOKS

- Gowers, E., *The Complete Plain Words*, Penguin, 1962.
- Treble, H. A. and Vallins, G. H., *An A.B.C. of English Usage*, Oxford, 1936.

* Textbooks for all engineering subjects include appropriate codes of practice, design charts and tables, standards, and handbooks.

SYLLABUS

Mechanics of Solids

Analysis of forces in simple trusses, frames and machines. Shearing force and bending moment diagrams for straight beams. Cables, catenaries. 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 stresses in beams. Torsion of solid and hollow circular shafts. Axially and eccentrically loaded 'short' and 'long' columns; Euler theory.

Deflection of statically determinate beams.

Properties of Materials

Materials in engineering. Definitions of properties of materials; measurements. Structure of metals: dislocation and other imperfections. Solid-solid phase equilibria, multi-phase systems. Grain structure, effects of deformation, recrystallisation, hot and cold working. Non-equilibrium relationships in multi-phase 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. Metal removal, surface finishing, joining. Materials in electric and magnetic fields. Introduction to ceramic phases and properties: refractories, cements, concretes. Organic phases: physical properties, applications. Elastomers. Insulators. Preservative coatings. Adhesives. Structure of wood, seasoning and preservation of timber.

Fluid Mechanics

Physical properties of fluids, fluid statics. Bernoulli equation, general energy equation. Laminar and turbulent flow, Reynolds number, pipe and channel flow. Introduction to hydraulic machines. Boundary layer theory. Lift and drag. Dimensional analysis.

Industrial Tour

Visits to industry, in which the staff will participate, will include the smelting and rolling of base metals; foundry work; manufacture of electronic components, small arms and motor vehicles; and several major civil engineering works.

TEXTBOOKS

- Timoshenko, S. & Young, D. H., *Elements of Strength of Materials*. 4th ed., Van Nostrand, 1962.
- Van Vlack, L. J., *Materials Science for Engineers*. Addison-Wesley, 1970.
- Begeman, M. L. & Amstead, B. H., *Manufacturing Processes*. 5th ed., Wiley, 1957.
- Beaumont, R. A., *Mechanical Testing of Materials*. 3rd ed., Pitman, 1963.
- Vennard, J. K., *Elementary Fluid Mechanics*, 4th ed., Wiley, 1966.

2725 Civil Engineering I

Lecture	76 hr
Laboratory/practical	64 hr
Survey camp	50 hr
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	190 hr
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SYLLABUS

Engineering Geology

Rocks and minerals: engineering properties, geological structures.

Geophysical exploration, physiography and mapping. Introduction to soil mechanics.

Engineering Surveying

Principles of construction, adjustment, use and care of surveying instruments—steel band, clinometer, compass, barometer, level, theodolite, optical square and tacheometer. Chain surveying and ranging of straight lines. Methods of recording data in field book. Spirit and barometric levelling. Measurement of angles with the theodolite. Errors due to maladjustment. Traversing with theodolite or compass. Traverse closures and adjustment. Calculation of missing data. Areas by double meridian distances. Elementary tacheometry. Methods of contouring. Interpretation and use of contours. Plotting of field notes. Earthworks and estimation of volumes. Setting out circular and transition curves. Road location surveys. Drainage surveys. Field work exercises based on the lecture syllabus. Survey camp—one week.

TEXTBOOKS

- Clark, K., *Plane and Geodetic Surveying for Engineers*. Vols 1 & 2, Constable, 1958.
- Allan, A. D., Hollwey, J. R. & Maynes, J. H. B., *Practical Field Surveying and Field Computations*, Heinemann, 1968.

- Mackie, J. B., *Astronomy for Surveyors*, 6th ed., Griffin, 1964.
 Mason, R. G., *Notes for Survey Chainmen*, State Rivers & Water Supply Commission, Victoria, 1965.
 Robson, D. A., *The Science of Geology*, Blandford, 1968.
 DSIR, *Soil Mechanics for Road Engineers*, HMSO, 1964.

2745 Electrical Engineering I

<i>Lecture</i>	84 hr
<i>Tutorial</i>	42 hr
<i>Laboratory</i>	42 hr
	168 hr

SYLLABUS

Electrical Circuit Theory

Solution of networks under transient and steady-state conditions. Characteristics of two-terminal linear and non-linear components. Alternating voltages and currents. Power. Resonance. Poly-phase circuits, star-delta transformations. Symmetrical components. Fourier series. Equivalent circuits.

Measurements and Measuring Instruments

Measurement errors and their calculation. Characteristics of instruments used in the measurement of electrical and non-electrical quantities.

Magnetic Circuits

Analogy with the electric circuit. Composite magnetic circuit. Magnetic circuit of electrical machine. Field plotting. Hysteresis and current loss.

Electronic Devices

Semiconductor diodes, transistors, thyristors, vacuum tubes, cathode-ray tubes.

Electronic Circuits

Rectifiers, amplifiers, simple logic circuits.

Audio-frequency Components

Characteristics and applications of selected types of microphones, loudspeakers and pick-up heads. Principles of disc, tape and wire recording.

Transformers

Construction of transformers. No-load operation. Operation under steady state loading conditions. Phasor diagrams and equivalent circuits.

Rotating Machines

The machine as an energy conversion device. Electrical, mechanical and magnetic interaction and losses. Elementary consideration of commutation.

TEXTBOOKS

Smith, R. J., *Circuits, Devices and Systems*, Wiley, 1966.

2767	Mechanical Engineering I	Lecture	56 hr
		Drawing Office/Laboratory	84 hr
			<hr/> 140 hr <hr/>

SYLLABUS

Thermodynamics

Fundamental laws of thermodynamics. Thermal properties of gases and vapours (including steam). Introduction to heat transfer. Engine testing, indicators, loading devices, instruments. Internal combustion engines, ideal cycles, performance and construction. Air compressors, gas turbines.

Mechanical Engineering Design

The general principles of design. The influence of manufacturing processes on design. Thread forms and standards. Strength of bolts. Limits and fits, stress concentration. 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. Elementary design of structures.

Drawing Office Practice

Design of simple elements for machines and structures.

TEXTBOOKS

- Spalding, D. B. and Cole, E. H., *Thermodynamics*, Arnold, 1964.
Walshaw, A. C., *Thermodynamics for Engineers*, 5th ed., Longmans, 1963.
Spotts, M. F., *Design of Machine Elements*, 3rd ed., Prentice-Hall, 1961.
Hoelscher, R. P. and Springer, C. H., *Engineering Drawing and Geometry*, 2nd ed., Wiley, 1961.
Rogers, G. F. C. and Mayhew, Y. R., *Engineering Thermodynamics, Work and Heat Transfer in S.I. Units*, 2nd ed., Longmans, 1967.
Gaylord, E. H. and Gaylord, C. N., *Design of Steel Structures*, McGraw-Hill, 1957.

3729 Structures I

Lecture	56 hr
Tutorial/Practical	112 hr
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	168 hr
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SYLLABUS

Structural Analysis and Design

Revision and extension of mechanics of solids. Types of loads on structures, safety factors, codes of practice. Design of structural elements in steel, timber, reinforced concrete, pre-stressed concrete. Connections.

Types of reactions, equilibrium, stability, determinacy, types of trusses. Joints, sections, graphical analysis. Strain energy. Analysis of indeterminate structures. Castigliano, least work, theorem of three moments, slope deflection, moment distribution, matrix methods of structural analysis. Approximate methods, portal method, cantilever method, assumed shear distribution in frames.

Design Office

A series of design projects relating to the above work in the design and preparation of working drawings for structures in timber, concrete, and steel.

TEXTBOOKS

- Norris, C. H. and Wilbur, J. B., *Elementary Structural Analysis*, 2nd ed., McGraw-Hill, 1960.
- Timoshenko, S. and Young, D. H., *Elements of Strength of Materials*, 4th ed., Van Nostrand, 1962.
- Gaylord, E. H. and Gaylord, C. N., *Design of Steel Structures*, McGraw-Hill, 1957.
- Cowan, H. J. and Smith, P. R., *Design of Reinforced Concrete*, Angus & Robertson, 1963.
- Mills, G. M., *The Theory of Structures*, Macmillan, 1965.
- Pearson, R. G., Kloot, N. H. and Boyd, J. D., *Timber Engineering Design Handbook*, 2nd ed., Jacaranda Press, 1970.
- Ferguson, P. M., *Reinforced Concrete Fundamentals*, 2nd ed., Wiley, 1965.
- Grinter, L. E., *Theory of Modern Steel Structures*, abridged ed., Macmillan, 1950.

SYLLABUS

Soils Engineering

Pressure, suction and movement of soil moisture, effective stress. Consolidation and settlement. Shear strength and testing of soils. Elastic theory of soil stress. Stability of slopes. Lateral earth pressure. Retaining walls. Foundation engineering; bearing capacity theory; allowable settlement, shallow and deep foundations; rafts; pile groups; site investigation as applicable to foundation design. Earth and rockfill dams, types, materials; stability analysis and design, construction problems.

Concrete Technology

Properties of concrete and its applications; structure and composition. Mechanical properties of hardened concrete. Mix design. Methods of testing constituent materials. Engineering and rheological behaviour of hardened concrete; comparison of strength and deformation relationships between mass concrete and structural members. Influence on stress distribution of reinforced and prestressed concrete members and mass concrete.

Durability, permeability, extensibility and crack resistance. Thermal effects. Residual stresses. Concrete manufacture, field control and acceptance. Non-destructive tests.

Hydraulics and Hydrology

Hydrologic cycle, water and energy balance, elements of meteorology, analysis of precipitation, infiltration, hydrograph analysis, flood estimation, yield and storage estimation. Hydraulic model theory, scale effect. Pipe networks, water hammer. Channel flow, steady non-uniform flow, backwater curves, hydraulic jump, unsteady flow, waves, flood routing. Flow measurement. Hydraulic machinery, characteristic curves, cavitation.

TEXTBOOKS

- Capper, P. L. and Cassie, W. F., *The Mechanics of Engineering Soils*, 5th ed., Spon, 1969.
- Terzaghi, K. and Peck, R. B., *Soil Mechanics in Engineering Practice*, 2nd ed., Wiley, 1969.
- Taylor, W. H., *Concrete Technology and Practice*, 3rd ed., Angus & Robertson, 1969.
- Rouse, H., *Engineering Hydraulics*, Wiley, 1961.
- Linsley, R. K. and Franzini, J. B., *Water Resources Engineering*, McGraw-Hill, 1964.
- Barna, P. S., *Fluid Mechanics for Engineers*, 2nd ed., Butterworth, 1964.

3743 Electrical Technology

<i>Lecture</i>	42 hr
<i>Tutorial/Laboratory</i>	42 hr
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	84 hr
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A course for civil and mechanical engineering students.

SYLLABUS

Basic d.c. and a.c. circuit theory. Measuring instruments. Storage batteries, d.c. machines, synchronous machines, induction motors, and transformers. Semi-conductor devices and vacuum tubes. Electronic circuitry including amplifiers, oscillators, and logic circuits. Principles of radio transmission and reception. Introduction to control systems and components.

TEXTBOOKS

Hughes, E., *Electrical Technology*, 4th ed., Longmans, 1969.
Sutcliffe, H., *Electronics for Students of Mechanical Engineering*, Longmans, 1964.

3747 Electrical Engineering II

<i>Lecture</i>	206 hr
<i>Tutorial</i>	100 hr
<i>Laboratory</i>	100 hr
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	406 hr
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SYLLABUS

Systems of Circuit Theory

Steady-state, transient and three-phase circuits. Network topology and matrix methods, state equations. Analysis of feedback systems. Distributed parameter systems.

Machines and Transformers

The principles of steady-state operation and an introduction to the transient operation of transformers and rotating machines used for the conversion of energy. Included in the course will be single and three-phase transformers, synchronous and asynchronous machines, direct current machines and metadynes.

Electronic Circuits and Signal Processing

Characteristics of transistors and other active devices. Small signal amplifiers, wide-band, direct-coupled, tuned. Regulated power supplies. Wave-shaping circuits, typical logic circuits, gates.

Department of Engineering

Power amplifiers, classes A, B and C. Oscillators, sinewave and limit cycle. Demodulation. Introduction to aerials and propagation. Modulation, need and types. Simple radio transmitter and receiver. Rectifiers and inverters, single and polyphase.

Computers

Programming, setting up and scaling problems on an analogue computer. The components of an analogue computer and their organisation into a computing system.

Number systems, codes, bi-stable devices, gates resistors, counters, code generators, addition, subtraction, multiplication and division. Implementation of designs in the laboratory using integrated circuits.

The components of a digital computer and their organisation into a computing system. Programming, numerical analysis.

Electron Physics and Devices

Band theory of solids as required by an engineer to enable him to understand the operation of solid-state devices. Surfaces and contacts. Junction, homogeneous and field-effect solid-state devices, including monolithic and thin film circuits. Vacuum and discharge tubes. Lasers.

TEXTBOOKS

Skilling, H. H., *Electrical Engineering Circuits*, 2nd ed., Wiley, 1965.
Angelo, E. J., *Electronics; BJT'S, FET'S and Microcircuits*, McGraw-Hill, 1969.

Glazier, E. V. C., and Lamont, M. R. L., *Transmission and Propagation*, HMSO, 1958.

Digital Equipment Corp., *Introduction to Programming*, 1968.

Hindmarsh, J., *Electrical Machines and their Applications*, 2nd ed., Pergamon, 1970.

Van der Ziel, A., *Solid State Physical Electronics*, 2nd ed., Prentice Hall, 1968.

3761 Applied Thermodynamics

<i>Lecture</i>	28 hr
<i>Tutorial</i>	28 hr

56 hr

A course for civil and electrical engineering students.

SYLLABUS

Historical introduction, classification of heat plant. Fuels, combustion. Internal combustion engines. External combustion engines. Performance of engines and matching to the requirements of the load. Air compressors. Refrigeration and heat pumps.

TEXTBOOKS

- Solberg, H. L., Cromer, O. C. and Spalding, A. R., *Thermal Engineering*, Wiley, 1960.
- Walshaw, A. C., *Thermodynamics for Engineers*, 5th ed., Longmans, 1963.

3771 Mechanical Engineering II

<i>Lecture</i>	238 hr
<i>Tutorial</i>	93 hr
<i>Laboratory</i>	89 hr

 420 hr

SYLLABUS

Thermodynamics

Theory of conductive heat transfer under steady conditions. Gas power cycles. Heat pump and refrigeration cycles. Combustion processes. Properties of mixtures. Air conditioning.

Fluid Dynamics

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 of Machines

Mechanisms. Instantaneous and vector velocity diagrams. Acceleration diagrams. Inertia torque. Balancing of rotating and reciprocating masses. Hydrodynamic and boundary lubrication of sliding pads and journal bearings. Vibration.

Stress Analysis

Equations of two dimensional theory of elasticity. Experimental methods of stress and strain analysis.

Materials

Further study of materials science. Ferrous and non-ferrous materials. Ceramics. Plastics.

Design

Analysis and design of mechanical components. Design of rotating and reciprocating machinery. Gear design. Pressure vessels. Limits and fits. Geometric analysis.

Instrumentation and Control

Principles of instrumentation; measurement techniques; measurement of physical quantities, recording and transmission of data. Introduction to theory of control—control system elements.

TEXTBOOKS

- Prandtl, L., *Essentials of Fluid Dynamics*, Blackie, 1963.
Green, W. G., *Theory of Machines*, 2nd ed., Blackie, 1964.
Timoshenko, S. and Goodier, J. N., *Theory of Elasticity*, 2nd ed., McGraw Hill, 1951.
Clark, D. S. and Varney, W. R., *Physical Metallurgy for Engineers*, 2nd ed., Van Nostrand, 1969.
Slaymaker, R. R., *Mechanical Design and Analysis*, Wiley, 1959.
Rogers, G. F. C. and Mayhew, Y. R., *Engineering Thermodynamics. Work and Heat Transfer in S.I. Units*, 2nd ed., Longmans, 1967.
Morrison, J. L. M. and Crossland, B., *An Introduction to the Mechanics of Machines in S.I. Units*, Longmans, 1970.
Dally, J. W. and Riley, W. F., *Experimental Stress Analysis*, McGraw-Hill, 1965.
Vennard, J. K., *Elementary Fluid Mechanics*, 4th ed., Wiley, 1966.
Webb, C. R., *Automatic Control, an Introduction*, McGraw-Hill, 1964.

4703 Project and Thesis

Tutorial 140 hr

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. Emphasis will be 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.

4705 Management Science

Lecture 112 hr
Tutorial 28 hr

140 hr

SYLLABUS

Theory of Management

Human aspects of scientific management, individual and group behaviour, communication, leadership, decision making. Functions and structure of industrial organisations, engineering management, technological change and automation.

Engineering Economics

Derivation of basic formulae of engineering economy. Interest and discount. Annual cost, present worth, and internal rate of return. Depreciation accounting. Replacement. Multiple alternatives. Economic studies for government investment. Benefit-cost analysis.

Operations Research

Basic systems concepts. Model building. Linear programming, applications to resource allocation and transportation problems. Network theory, applications to project planning and control with CPM and PERT. Theory of games. Dynamic programming. Inventory control. Simulation and optimisation. Probabilistic models and queuing theory.

TEXTBOOKS

- Maynard, H. B., *Industrial Engineering Handbook*, 2nd ed., McGraw-Hill, 1963.
- Antill, J. M., *Civil Engineering Management*, Angus & Robertson, 1970.
- Ryan, P. W. S., *Engineering Administration*, 2nd ed., Angus & Robertson, 1969.
- Sasieni, M., Yaspan, A. and Freedman, L., *Operations Research Methods and Problems*, Wiley, 1959.
- De Garmo, E. P., *Engineering Economy*, 4th ed., MacMillan, 1969.
- Taylor, G. A., *Managerial and Engineering Economy*, Van Nostrand, 1964.
- Grant, E. L. and Ireson, W. G., *Principles of Engineering Economy*, 5th ed., Ronald, 1964.

4721 Structures II

<i>Lecture</i>	36 hr
<i>Tutorial/Laboratory</i>	48 hr
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	84 hr
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SYLLABUS

Deflection of structures, virtual work, Castigliano, moment area, Williot-Mohr method, Maxwell's reciprocal theorem, influence lines.

Arches, cables, suspension bridges.

Ultimate strength design of concrete structures. Limit design of steel structures. Model analysis, photo-elasticity, brittle coatings, general case of plane stress, rosettes. Pre-stressed concrete.

TEXTBOOKS

- Lin, T. Y., *Design of Prestressed Concrete Structures*, 2nd ed., Wiley, 1963.
- Lee, G. H., *An Introduction to Experimental Stress Analysis*, Wiley, 1950.
- Norris, C. H. and Wilbur, J. B., *Elementary Structural Analysis*, 2nd ed., McGraw-Hill, 1960.
- Timoshenko, S. and Young, D. H., *Elements of Strength of Materials*, 4th ed., Van Nostrand, 1962.
- Gaylord, E. H. and Gaylord, C. N., *Design of Steel Structures*, McGraw-Hill, 1957.
- Cowan, H. J. and Smith, P. R., *Design of Reinforced Concrete*, Angus & Robertson, 1963.
- Mills, G. M., *The Theory of Structures*, Macmillan, 1965.
- Pearson, R. G., Kloot, N. H. and Boyd, J. D., *Timber Engineering Design Handbook*, 2nd ed., Jacaranda Press, 1970.
- Ferguson, P. M., *Reinforced Concrete Fundamentals*, 2nd ed., Wiley, 1965.
- Grinter, L. E., *Theory of Modern Steel Structures*, abridged ed. Macmillan, 1950.

4723 Civil Engineering III

<i>Lecture</i>	96 hr
<i>Tutorial/Practical</i>	72 hr
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	168 hr
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SYLLABUS

Roads and Aerodromes

Route analysis and road location in rural and urban environment, including location of bridges. Road geometrics and design, its influence on behaviour of drivers. Landscape aspects of road design—examples of road design policies and their application. Design of roads, expressways, intersections and interchanges, Pavement requirements, thickness design, pavement materials, gravels, stabilisation, cement and bituminous concrete. Wearing courses. Use of computers in road design.

Application to aerodrome problems, characteristics of aeroplane loading on pavements. Hydrology of aerodrome and road drainage ; culvert design. Drawing office design problems on roads and aerodromes.

Engineering and Building Construction

Construction plant and equipment—compressed air services, tunnelling and blasting; hoisting and conveying; earthmoving, pile driving, etc.

Construction administration—planning and scheduling. Applications of operations research to project planning; cost control and cost accounting; tenders and preparation of estimates, contracts and specifications.

Special problems in building construction.

Water and Public Health Engineering

Channel flow, steady non-uniform flow, backwater curves, hydraulic jump, unsteady flow, waves, flood routing. Flow measurement. Hydraulic machinery, radial and axial flow, characteristic curves, cavitation.

More advanced treatment of hydrologic yield and flood problems, soilwater and groundwater hydrology—application of principles to common practical problems.

Processes of decomposition and decay; chemical and biochemical measurement of degree of pollution; basic principles of the treatment of polluted waters. Water supply schemes; principles and practice of water treatment; sewerage systems; construction of sewers; pumping stations; sewerage treatment and disposal; swimming pools; refuse disposal.

TEXTBOOKS

Antill, J. M. and Ryan, P. W. S., *Civil Engineering Construction*, 2nd ed., Angus & Robertson, 1965.

Antill, J. M., *Civil Engineering Management*, Angus & Robertson, 1970.

Rouse, H., *Engineering Hydraulics*. Wiley, 1961.

Linsley, R. K. and Franzini, J. B., *Water Resources Engineering*, McGraw-Hill, 1964.

Bolton, R. L. and Klein, L., *Sewerage Treatment. Basic Principles and Trends*, Butterworth, 1961.

Fair, G. M. and Geyer, J. C., *Elements of Water Supply and Waste Water Disposal*, Wiley, 1965.

Sherrard, H. M., *Australian Road Practice*, MUP, 1965.

DSIR, *Soil Mechanics for Road Engineers*, HMSO, 1964.

Barna, P. S., *Fluid Mechanics for Engineers*. 2nd ed., Butterworth, 1964.

4741 Electrical Engineering III

Lecture	126 hr
Laboratory/Tutorial	126 hr
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	252 hr
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SYLLABUS

A selection of three courses from the following list, as approved by the Head of Department.

Circuits, Signals and Information Theory

Circuit theory and network synthesis. Signal analysis and transmission through networks, including theory of noise and stochastic signals. Time, frequency and mixed domain presentation ; transients and other signals; correlation, convolution, etc.; statistical properties of signals; application. Information theory of discrete systems including coding and encoding of patterns. Information theory of continuous systems. Mathematical theory of signal detection, including an introduction to decision theory. Signal and system analysis in the light of information theory.

TEXTBOOK

Karbowiak, A. E., *Theory of Communications*, Oliver & Boyd, 1969.

Electronics

An introduction to modern filter theory ; pulse spectra. Amplifiers : wide band, compensation ; direct coupled, operational amplifiers, regulators. Pulse and digital circuits ; semi-conductor switches ; emitter coupled multivibrators ; blocking oscillators. Integrated circuits : non-linear and linear ; use in systems. Power converters : polyphase rectifiers, controlled rectifiers ; high voltage converters, inverters. Semi-conductor controls : motor controls, firing circuits, etc. Reliability engineering : calculation of MTBF ; statistical and worst case design ; environmental and operating stresses.

TEXTBOOK

No set text.

Machines and Power

Three-phase circuit theory, power measurement, machine inductances.

Cross-field d.c. machines. Thyristor speed control. Acceleration braking.

Polyphase and single-phase induction motors—speed control by rotor injection and stator frequency control—acceleration and braking.

Synchronous generators and motors, cylindrical and salient poles, locus diagrams, transients, faults, motor pull-in, hunting.

Transmission line parameters, symmetrical components, transformers, steady-state system calculations for balanced and fault conditions.

Load and frequency control of a single machine, steady-state and transient stability.

TEXTBOOK

Brosan, A. S. and Hayden, J. T., *Advanced Electrical Power and Machines*, Pitman, 1966.

Automatic Control

Principles and techniques applicable to the analysis and design of feedback control systems encountered in industrial processes. Frequency transform and state space methods for compensation and stability analysis of single-input, single-output linear systems, extension to include some common nonlinearities. Optimum design including identification of process parameters by both on-and off-line methods.

TEXTBOOK

Gupta, S. C. and Hasdorft, L., *Fundamentals of Automatic Control*, Wiley, 1970.

Computer Control

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 simulating of physical processes. Concepts basic to optimisation. Parameter and state estimation in linear systems by regression methods. Parameter and state estimation in linear and nonlinear systems using parameter influence coefficients. Optimal control theory. Adjoint variable techniques applied to parameter and state estimation. The implementation of optimal control.

TEXTBOOK

Speedy, C. B., Brown, R. F. and Goodwin, G. C., *Control Theory*, Oliver & Boyd, 1970.

Antennas, Propagation and Guided Waves

Retarded potentials, the fields due to a current element, Poynting's vector, wave impedance of space. Linear antennas, current distribution, radiation resistance, directional characteristics. Effects of ground. Antenna arrays, antenna network theorems, polar diagrams of arrays, gain, directivity and bandwidth. Aperture antennas. Radio wave propagation. Surface, ground, direct and reflected waves. Ionospheric propagation, tropospheric scatter propagation.

Guided Waves: transmission line theory including losses, dispersion matching and solution of problems. Types of transmission lines including coaxial lines, microstrip, triplate, surface wave lines, etc.

Waveguides: theory of rectangular and circular waveguides: attenuation, dispersion and discussion on waveguide practice. Microwave circuits including discussion on irises, corners, tees, directional couplers, hybrids, transformers, etc.; non-reciprocal devices; cavities and other resonant structures. Discussion of modern microwave sources.

TEXTBOOK

Glazier, E. V. D. and Lamont, M. R. L., *Transmission and Propagation*, HMSO, 1958.

Communications Electronics

Signal Processing and Techniques: modulation principles and techniques, DSB, SSB, FM, PM, pulse modulation circuits. Demodulation. Bandwidth, signal to noise ratio, noise factor. Tuned power amplifiers, lumped tuned circuits, distributed tuned circuits. Devices: properties and circuits of small-signal amplifiers. Noise and high-frequency performance of passive and active devices and circuits. Parametric amplifiers. Quantum electronic devices, e.g. masers and lasers. Semi-conductor bulk-effect devices: microwave high-power vacuum-device amplifiers.

TEXTBOOK

Betts, J. A., *Signal Processing, Modulation and Noise*, EUP, 1970.

Communication Systems

Sound systems: psychoacoustics, loudness, pitch, masking, binaural effects, characteristics of speech, bandwidth and intelligibility. Sound sources, piston radiator, exponential horn. Acoustic and mechanical equivalent circuits' transducers. Introduction to room acoustics. Telephone, telegraph and data systems: general principles, multiplexing, carrier systems, code, speech and data transmission, telemetry, facsimile. Television systems: physiological aspects of television, television standards, colour systems, transmitters, receivers. Radar: principles of pulse and C.W. radar, distance and direction measuring equipment for navigation and surveying.

TEXTBOOK

No set text.

4761 Mechanical Engineering IIILecture 126 hr
Laboratory/Tutorial 126 hr

252 hr

SYLLABUS

A selection of three courses from the following list, as approved by the Head of Department:

Dynamics of Machines

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.

Mechanical Vibrations: Two- three- and multi-degree of freedom systems; natural modes, forced vibrations, whirling of shafts with many degrees of freedom.

Advanced Dynamics: Velocities and accelerations in three dimensional co-ordinate systems. Moving frames of reference. Lagrange's equations. Euler's equations of motion.

TEXTBOOKS

Church, A. H., *Mechanical Vibrations*, 2nd ed., Wiley, 1963.

Hirschhorn, J., *Kinematics and Dynamics of Plane Mechanisms*, McGraw-Hill, 1962.

Holowenko, A. R., *Dynamics of Machinery*, Wiley, 1962.

Morrison, J. L. M. and Crossland, B., *An Introduction to the Mechanics of Machines in S.I. Units*, Longmans, 1970.

Mechanics of Solids

Applied Elasticity: Plates and shells, rotating discs, contact stresses.

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.

Theory of Plasticity: Slip line field theory, velocity fields, stress fields, upper and lower bounds.

Applied Plasticity: Analysis of forming and machining processes.

TEXTBOOKS

- Den Hartog, J. P., *Advanced Strength of Materials*, McGraw-Hill, 1952.
- Wang, C. T., *Applied Elasticity*, McGraw-Hill, 1953.
- Johnson, W. and Mellor, P. B., *Plasticity for Mechanical Engineers* Van Nostrand, 1962.

Fluid Dynamics

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.

TEXTBOOKS

- Longwell, P. A., *Mechanics of Fluid Flow*, McGraw-Hill, 1966.
- Shepherd, D. G., *Principles of Turbomachinery*, Macmillan, 1957.
- Whitaker, S., *Introduction to Fluid Mechanics*. Prentice Hall, 1968.

Thermodynamics. (A selection from the following topics) :

General thermodynamics relations. Statistical mechanics. Quantum mechanics. Monoatomic gases and solids. Diatomic and polyatomic gases. Chemical equilibrium. Statistical mechanics of dependent particles. Real gases and solids. Irreversible processes. Fuel cells. Solar energy by direct absorption and photo-voltaic means. Thermionic generators. Magnetic hydrodynamic power generation. Thermoelectric generation. Convective and radiant heat transfer.

TEXTBOOKS

- Kays, W. M., *Convection Heat and Mass Transfer*. McGraw-Hill, 1966.
- Chang, S. S. L., *Energy Conversion*. Prentice Hall, 1963.
- Angrist, S. W., *Direct Energy Conversion*. Allwyn and Bacon, 1965.
- Van Wylen, G. J. and Sonntag, R. E., *Fundamentals of Classical Thermodynamics*. Wiley, 1965.
- Van Wylen, G. J. and Sonntag, R. E., *Fundamentals of Statistical Thermodynamics*. Wiley, 1966.
- Rogers, G. F. C. and Mayhew, Y. R., *Engineering Thermodynamics, Work and Heat Transfer in S.I. Units*. 2nd ed., Lohmans, 1967.
- Cohen, H. and Rogers, G. F. C., *Gas Turbine Theory*. Longmans, 1951.

Control Theory

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.

TEXTBOOKS

Webb, C. R., *Automatic Control, an Introduction*, McGraw-Hill, 1964.

Thaler, C. J. and Brown, R. G., *Feedback Control Systems*, 2nd ed., McGraw-Hill, 1960.

Design for Production

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.

TEXTBOOKS

Gladman, C. A., *Manual for Geometric Analysis of Engineering Designs*, Aus. Trade Pub., 1966.

**Department of Government
and Economics**

1625 Government I

Lectures and Tutorials 84 hr

SCOPE

An introduction to the subject, with particular reference to democratic government in Britain, and Australia.

SYLLABUS

1. *Britain*: including constitution, parliament, cabinet, elections, parties.
2. *Australia*: Federal and State governments: federal relations, elections, parties, pressure groups; administration and the Public Service.

TEXTBOOKS

- Carter, G. M. and Herz, J. H., *Government and Politics in the Twentieth Century*, Thames & Hudson, 1961.
- Jennings, I., *The Queen's Government*, Pelican, 1964.
- Blondel, J., *Voters, Parties and Leaders*, Pelican, 1966.
- Taylor, E., *The House of Commons at Work*, 6th ed., Pelican, 1965.
- Moodie, G. C., *The Government of Great Britain*, Methuen, 1965.
- Stankiewicz, W. J., *Crisis in British Government*, Collier, 1967.
- Birch, A. H., *The British System of Government*, Allen & Unwin, 1967.
- Mayer, H., *Australian Politics: A Reader*, Cheshire, 1967.
- Mayer, H., *Australian Politics: A Second Reader*, Cheshire, 1969.
- Menzies, R., *Central Power in the Australian Commonwealth*, Cassell, 1968.
- Spann, R. N., *Public Administration in Australia*, N.S.W. Government Printer, 1964.
- Crisp, L. F., *Australian National Government*, Longmans, 1965.
- Rejai, M., *Democracy*, Atherton, 1967.
- Macpherson, C. B., *The Real World of Democracy Clarendon, 1966*.

REFERENCE BOOKS

- Beer, S. H., *Modern British Politics*, Faber & Faber, 1965.
- MacIntosh, J. P., *The British Cabinet*, 2nd ed., Methuen, 1962.
- Dicey, A. V., *Law of the Constitution*, 10th ed., Macmillan, 1962.
- Hughes, C. A. (ed.), *Readings in Australian Government*, University of Queensland Press, 1968.
- Overacker, L., *Australian Political Parties in a Changing Society*, Cheshire, 1968.
- Jupp, J., *Australian Political Parties*, M.U.P., 1968.

SYLLABUS

A study of the development, form and practice of the political systems of:

1. U.S.A.
2. U.S.S.R.
3. China

TEXTBOOKS

- Raymond, E., *The Soviet State*, Macmillan, 1968.
- Carew Hunt, R. N., *The Theory and Practice of Communism*, rev. ed., Bles, 1962.
- Hazard, J. N., *The Soviet System of Government*, Chicago, 1965.
- Schaffer, H. G., *The Soviet System in Theory and Practice*, Appleton Century, 1965.
- Meyer, A. G., *Communism*, Random House, 1967.
- Meyer, A. G., *The Soviet Political System*, Random House, 1965.
- Dallin, A. and Larson, T. B., *Soviet Politics since Khrushchev*, Spectrum, 1968.
- Lewis, J. W., *Major Doctrines of Communist China*, Norton, 1964.
- Lewis, J. W., *Leadership in Communist China*, Cornell, 1966.
- Houn, F. W., *Short History of Chinese Communism*, Prentice-Hall, 1967.
- Latourette, K. S., *China*, Prentice-Hall, 1965.
- Riker, W. H., *Democracy in the United States*, 2nd ed., Collier, 1965.
- Rossiter, C., *Parties and Politics in America*, Cornell, 1966.
- White, T. H., *The Making of the President, 1964*, Cape, 1965.
- Warren, S. (ed.), *The American President*, Prentice-Hall, 1967.
- de Grazia, A., *Congress: The First Branch of Government*, Anchor, 1967.

REFERENCE BOOKS

- Churchward, L. G., *Contemporary Soviet Government*, Routledge & Kegan Paul, 1968.
- Adams, R. (ed.), *Contemporary China*, Pantheon, 1966.
- MacFarquhar (ed.), *China Under Mao*, M.I.T., 1966.
- Fainsod, M., *How Russia is Ruled*, 2nd ed., Harvard, 1963.
- Schapiro, L., *The Government and Politics of the Soviet Union*, 2nd ed., H.U.L., 1967, paperback.
- Berman, H. J., *Justice in the U.S.S.R.*, rev. ed., Vintage Books, 1963, paperback.
- Young, W. H. (ed.), *Ogg and Ray's Essentials of American Government*, 10th ed., Appleton-Century-Crafts, 1969.
- Burns, J. M. and Peltason, J. W., *Government by the People*, 6th ed., Prentice-Hall, 1966.

3627 Government III

Lectures and Tutorials 84 hr

PRE-REQUISITE

The completion of Government I and II or the completion of Government I and History I and II.

OUTLINE OF COURSE

Part I: Theory; The Central Balance, European International Relations; The U.N.

- (a) Some theoretical concepts: sovereignty, nationalism, power, community, alliance. The 'realist' theory of international relations and its critics. Constraint, negotiation, legal regulation, limited and total war.
- (b) U.S.-Soviet relations since 1945.
- (c) Eastern Europe since 1945.
- (d) Western Europe since 1945 with special reference to the German problem.
- (e) The U.N. and the control of armaments.

Part II: Asian International Relations and Foreign Policy

- (a) Asia in world politics: the policies of the Great Powers—the U.S., the Soviet Union and China.
- (b) Japan, India and the significance of the forces of non-alignment.
- (c) Southeast Asia with special reference to the Indonesian-Malaysian area.
- (d) Australian foreign and defence policies since the second world war.

TEXTBOOKS

Morgenthau, H. J., *Politics Among Nations*, Knopf, 1968.

Claude, I. L., *Power and International Relations*, Random House, 1965.

Robertson, C. L., *International Relations since World War II*, John Wiley, 1966.

Fifield, R.A., *Southeast Asia in United States Foreign Policy*, Praeger, 1963.

Millar, T. B., *Australian Foreign Policy*, Angus & Robertson, 1968.

REFERENCE BOOKS

Aron, R., *Peace and War*, Weidenfeld and Nicolson, 1966.

Deutsch, K. W., *The Analysis of International Relations*, Prentice-Hall, 1968.

Fliess, P. J., *International Relations in the Bipolar World*, Random House, 1968.

Claude, I. L., *Swords into Plowshares. The Problems and Progress of International Organisations*, Random House, 1964.

Mendel, D., *American Foreign Policy in a Polycentric World*, Dickinson, 1968.

McNeal, R. H. (ed.), *International Relations Among Communists*, Prentice-Hall, 1967.

Levi, W., *The Challenge of World Politics in South and Southeast Asia*, Prentice-Hall, 1968.

1609 Economics I

Lectures 84 hr
Tutorials 28 hr

SYLLABUS

1. Analysis of the pricing mechanism: the differing types of economy; demand, supply and markets; the basis of demand, consumption and marginal utility, the demand curve; concept of production; brief analysis of supply, combination of factors, variable returns to inputs, costs; demand, supply and price.
2. National product, national income and national expenditure; their meaning and significance; elementary social accounting.
3. Theory of income determination in closed and open systems.
4. Money and banking in the context of macroeconomics.
5. The Balance of Trade, significance for economic policy.
6. The aims of economic policy.

TEXTBOOKS

Government Printer, *National Income and Expenditure*, latest issue.

Downing, R. I., *National Income and Social Accounts*, 9th ed., Melbourne U.P., 1965.

Ferguson, C. E., and Kreps, J. M., *Principles of Economics*, 2nd ed., Holt, Rinehart & Winston, 1965.

The Reserve Bank of Australia, 1966.

Harcourt, G. C., Karmel, P. H. and Wallace, R. H., *Economic Activity*, Cambridge U.P., 1967.

Lipsey, R. G., *An Introduction to Positive Economics*, 2nd ed., Weidenfeld and Nicolson, 1966.

Samuelson, P. A., Hancock, K. and Wallace, R., *Economics, Australian Edition*, McGraw-Hill, 1970.

REFERENCE BOOKS

- Kurihara, K. K., *Monetary Theory and Public Policy*, Allen & Unwin, 1965.
- Brooman, F. S., *Macroeconomics*, Allen & Unwin, 1962.
- Stonier, A. W. and Hague, D. C., *A Textbook of Economic Theory*, 2nd ed., Longmans, 1961.
- Arndt, H. W. and Corden, W. M., *The Australian Economy: A Volume of Readings*, Cheshire, 1963.
- Leftwich, R. H., *The Price System and Resource Allocation*, 4th ed., Holt, Rinehart & Winston, 1970
- Sirkin, G., *Introduction to Macroeconomic Theory*, revised ed., Irwin, 1965.
- Arndt, H. W. and Harris, C. P., *The Australian Trading Banks*, 3rd ed., Cheshire, 1965.

2607 Economics II

Lectures 84 hr
Tutorials 28 hr

SYLLABUS

1. Theory of the Firm ; production theory and the derivation of cost and supply functions ; the model of a firm in pure competition ; the theory of distribution ; models of divergence from pure competition ; alternative pricing policies, the problem of advertising and selling costs ; firm growth ; managerial influences in the theory of the firm ; innovation and firm growth ; the relationship between R & D expenditure and firm size.
2. International Economics : the balance of payments, the principle of comparative advantage, principles of international trade policy, prices and the terms of trade, exchange rates, economic integration, international commercial co-operation, the balance-of-payments problem.
3. Economic Policy : the need for government intervention, alternative theories of inflation, monetary and fiscal policies, the nature of income policies, international policy instruments, special cases of policy.

TEXTBOOKS

- Samuleson, P. A., Hancock, K., and Wallace, R., *Economics, Australian Edition*, McGraw-Hill, 1970.
- Kindleberger, C. P., *International Economics*, 3rd ed., Irwin, 1965.
- Walter, I., *International Economics*, Ronald Press, 1968.
- Nevile, J. W., *Fiscal Policy in Australia: Theory and Practice*, Cheshire, 1970.
- Ferguson, C. E., *Microeconomic Theory*, Irwin, 1969.
- Spencer, Milton H., *Managerial Economics—Text, Problems and Short Cases*, Irwin, 1968.
- Siegel, B. N., *Aggregate Economics and Public Policy*, Irwin, 1970.

REFERENCE BOOKS

- Karmel, P. H. and Brunt, M., *The Structure of the Australian Economy*. Cheshire, 1962.
- Stonier, A. W. and Hague, D. C., *A Textbook of Economic Theory*, 2nd ed., Longmans, 1961.
- Ferguson, C. E. and Kreps, J. M., *Principles of Economics*, 2nd ed., Holt, Rinehart & Winston, 1965.
- Clark, J. J., *The New Economics of National Defence*. Random House, 1966.
- Caves, R., *American Industry: Structure, Conduct, Performance*, Prentice-Hall, 1964.
- Dorfman, R., *The Price System*. Prentice-Hall, 1964.
- Scitovsky, T., *Welfare and Competition*. Allen & Unwin, 1964.
- Robinson, E. A. G., *Monopoly*. Cambridge U.P., 1963.
- Kenen, P. B., *International Economics*. Prentice-Hall, 1964.
- Staley, C. E., *International Economics*. Prentice-Hall, 1970.
- Backman, J. et al, *War and Defence Economics*. Rinehart, 1952.
- Marris, R., *The Economic Theory of Managerial Capitalism*, 1966.
- Ranlett, J. G., *Money and Banking: An Introduction to Analysis and Policy*. Wiley, 1969.
- Shapiro, E., *Macroeconomic Analysis*, 2nd ed., Harcourt, Brace and World Inc., 1970.
- Sherer, F. M., *Industrial Market Structure and Economic Performance*, Rand McNally, 1970.

3609 Economics III

Lectures 84 hr

Tutorials 28 hr

SYLLABUS

1. International monetary economics : foreign exchange dealings, international monetary and financial institutions, gold, reserve currencies, international liquidity reserves, international capital flows and the transfer problem.
2. Economic development: development problems of both advanced and under-developed countries, with emphasis on the latter.
3. Comparative economic systems: the study of and types of economic systems, economic planning and management, prices, consumption and investment, incentives, trade, economic growth, evaluation of Capitalism and Socialism.

TEXTBOOKS

- Cooper, R. N. (ed.), *International Finance*, Penguin, 1969.
- Hirsch, F., *Money International*, Penguin, 1969.
- Machlup, F., *Remaking the World's Monetary System*, Johns Hopkins, 1968.
- Bhagwati, J., *The Economics of Underdeveloped Countries*, World U.L., 1966.
- Meier, G. M. and Baldwin, R. E., *Economic Development: Theory, History, Policy*, Wiley, 1963.
- Spiegelglas, S. and Welsh, C. J., *Economic Development: Challenge and Promise*, Prentice-Hall, 1970.
- Halm, G. N., *Economic Systems. A Comparative Analysis*, 3rd ed., Holt, Rinehart & Winston, 1968.
- Wilczynski, J., *The Economics of Socialism*, George Allen & Unwin, 1970.

REFERENCE BOOKS

- Fellner, W., et al, *Maintaining and Restoring Balance in International Payments*, Princeton, 1966.
- Kindleberger, C. P., *International Economics*, 3rd ed., Irwin, 1965.
- Perkins, J. O. N., *International Policy for the World Economy*, George Allen & Unwin, 1969.
- Hirschman, A. O., *The Strategy of Economic Development*, Yale, 1965.
- Meier, G. M., *Leading Issues in Development Economics*, Oxford U.P., 1964.
- Myint, H., *The Economics of Developing Countries*, Hutchinson, 1964.
- Feinstein, C. H. (ed.), *Socialism, Capitalism and Economic Growth*, Cambridge U.P., 1967.
- Grossman, G., *Economic Systems*, Prentice-Hall, 1967.
- Gruchy, A. G., *Comparative Economic Systems*, Houghton Mifflin, 1966.
- Snively, W. P., *Theory of Economic Systems*, Merrill, 1969.
- Turgeon, L., *The Contrasting Economies*, revd. ed., Allyn & Bacon, 1969.

1651 Geography I

Lectures 84 hr
Tutorial and Laboratory 28 hr

SCOPE

The course provides a study of the various elements of the natural environment, of world population problems, and of the principles of resource-utilisation for peace and war purposes. It is designed to serve both as a self-contained study and as a basis for more advanced work.

SYLLABUS

Part I: Physical Geography

- (a) Weather and climate
- (b) Hydrologic cycle and water balance
- (c) Land forms—elementary geomorphology
- (d) Concept of an ecosystem
- (e) Land assessment

Part II: Human Geography

- (a) The first section considers the perception and utilisation of the resource-base by different societies :
 - (i) The concept of a resource: the naturally provided and man-produced resources; population as a resource and as resource-requiring.
 - (ii) Pressure on resources: policy to assess and develop a nation's domestic resources; policy to obtain access to foreign resources.
 - (iii) Differing national and regional employment patterns; land-labour-capital complementarity and substitutability; labour and capital intensities; productivity and living standards.
- (b) The second section investigates the world's more important types of economic activity with particular emphasis on the theory behind their spatial distribution :
 - (i) Food and industrial crop production—subsistence production patterns; commercial production—principles of agricultural location, the main types of farm economy, their differing environmental and other controls. World nutrition and related health problems.
 - (ii) Mining, manufacturing, and tertiary industry: elements of location theory. Application to strategic materials, industries and urban agglomerations, with case studies from the world's major urban-industrial regions.
 - (iii) Economic, political and strategic aspects of world transport and trade.

TEXTBOOKS

- Strahler, A. N., *Introduction to Physical Geography*, Wiley, 1967.
- Trewartha, G. T., Robinson, A. H. and Hammond, E. H. *Elements of Geography*, 5th ed., McGraw-Hill, 1967.
- Hills, E. S., *Physiography of Victoria*, Whitcombe & Tombs, 1946.
- Twidale, C. R. and Foale, M. R., *Landforms Illustrated*, Nelson, 1969.
- Hare, F. K., *The Restless Atmosphere*, Hutchinson, 1967.
- Leeper, G. W. (ed.): *The Australian Environment*, 4th ed., Melbourne U. P., 1970.
- Tweedie, A. D., *Water and the World*, Nelson, 1967.
- Alexander, J. W., *Economic Geography*, Prentice-Hall, 1964.
- Rutherford, J., Logan, M. I. and Missen, G. J., *New Viewpoints in Economic Geography*, Martindale Press, 1966.
- Erlach, P. R. and Erlach, A. H., *Population, Resources, Environment*, Freeman, 1970.
- Zelinsky, W., *A Prologue to Population Geography*, Prentice-Hall, 1966.
- Ginsburg, N., *Atlas of Economic Development*, Chicago, 1961.
- Lewis, C. and Campbell, J. D. (eds.), *The Oxford Atlas*, Oxford U.P., 1965.
- Oxford Economic Atlas of the World*, 3rd ed., Oxford U.P., 1965.

2653 Geography II

<i>Lectures</i>	58 hr
<i>Laboratory/Tutorials</i>	58 hr

SYLLABUS

1. Environment studies: a study of the physical and human geography of Australia and New Guinea, with special reference to differences between the temperate, arid, savanna and tropical humid environments.
2. Geography of transportation: transport networks and graph theory; measures of connectivity; the bases of interaction; the geography of ports and air transport; freight rates and their geographical effects.
3. Population and disease: the geography of fertility and death; aspects of medical geography.

Laboratory and practical work: exercises in land assessment in conjunction with the environment studies; network analysis; statistical analysis related to population.

TEXTBOOKS

- Rutherford, J., Logan, M. I. and Missen, G. J., *New Viewpoints in Economic Geography*, Martindale Press, 1966.
- Rose, A. J., *Patterns of Cities*, Nelson Paperback, 1968.
- Leeper, G. W. (ed.), *The Australian Environment*, 4th ed., Melbourne U.P., 1970.
- Andrews, J., *Australian Resources and Their Utilisation*, Sydney U., 1970.
- Howlett, D., *A Geography of Papua and New Guinea*, Nelson Paperback, 1967.
- Taaffe, E. J., and Gauthier, H. J., *Geography of Transportation*, Prentice-Hall.
- Dury, G. H. and Logan, M. I., *Studies in Australian Geography*, Heinemann, 1968.
- Ward, R. G., and Lea, D. A. M., *Atlas of Papua and New Guinea*, Collins, 1970.
- Wilson, M. G. A., *Population Geography*, Nelson, 1968.
- Avery, T. E., *Interpretation of Aerial Photographs*, 2nd ed., Burgess, 1968.
- Lewis, C. and Campbell, J. D. (eds.), *The Oxford Atlas*, Oxford U.P., 1963.

3651 Geography III

<i>Lectures</i>	58 hr
<i>Laboratory/Tutorials</i>	58 hr

SYLLABUS

1. *The Ecosystem*: An examination of the components and their inter-relationships with special reference to the development of vegetation and soils in tropical and savanna regions.
2. *The Geography of Military Campaigns*: The influence of land-forms, soils, vegetation and climate on selected military campaigns in South-East Asia, viz. : the Burma and Philippines campaigns in World War II ; the Malayan Emergency ; the Indonesian Confrontation and the Vietnam War.
3. *Man and His Environment*: Conflicts of economic land use and settlement patterns with the aims of environmental a conservation.
4. *Population and Disease*: The geography of fertility and death. Aspects of medical geography.

Laboratory and Field Work: Techniques of air photo and map analysis ; the principles and problems of land assessment for civilian and military purposes. Analysis of population statistics.

TEXTBOOKS

Eyre, S. R., *Vegetation and Soils*, 2nd ed., Arnold, 1968.

Peltier, L. C. and Percy, G. E., *Military Geography*, Van Nostrand, 1966.

Erlich, P. R. and Erlich, A. H., *Population, Resources, Environment*, Freeman, 1970.

Wilson, M. G. A., *Population Geography*, Nelson, 1968.

Stewart, G. A. (ed.), *Land Evaluation*, Macmillan, 1968.

Avery, T. E., *Interpretation of Aerial Photographs*, 2nd ed., Burgess, 1968.

Department of History

1405 History I

Lectures	56 hr
Tutorials	28 hr

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 eighteenth-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 1815–1848; 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.

RECOMMENDED TEXTS

Anderson, M. S., *Europe in the Eighteenth Century*, Longmans, London, 1963.

Craig, G. A., *Europe Since 1815*, Holt, New York, 1966.

Current, R. N., and others, *American History: A Survey*, Alfred A. Knopf, New York, 1965.

Dalton, B. J., *Origins of the American Civil War*, Cheshire, Melbourne, 1967.

Ropp, T., *War in the Modern World*, Duke U.P., Durham, N.C., 1966.

Rudé, G., *Revolutionary Europe 1783–1815*, Collins, London, 1967.

Tierney, B. and others, *Great Issues in Western Civilization, Vol. II*, Random House, New York, 1967.

Turner, L. C. F., *The American Civil War and Reconstruction 1861–1877*, Cheshire, Melbourne, 1971.

2407 History II

Lectures 58 hr
Tutorials 29 hr

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 of 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 post-war 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 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 beginnings 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.

RECOMMENDED TEXTS

- Gilbert, F., *The End of the European Era, 1890 to the Present*, Norton, New York, 1970.
- Current, R. N. and others, *American History: A Survey*, Alfred A. Knopf, New York, 1965.
- Gathorne-Hardy, G. M., *A Short History of International Affairs 1920–1939*, Oxford U.P., London Revised ed., 1964.
- Michael, F. H. and Taylor, G. E., *The Far East in the Modern World*, revised ed., Methuen, London, 1964.
- O'Neill, R. J., *General Giap—Politician and Strategist*, Cassell, Melbourne, 1969.
- Pinson, K. S., *Modern Germany*, Macmillan, New York, 1967.
- Ropp, T., *War in the Modern World*, Duke U.P., Durham, N.C., 1966.
- Tierney, B., and others, *Great Issues in Western Civilization*, Vol. II, Random House, New York, 1967.
- Turner, L. C. F., *The First World War*, Cheshire, Melbourne, 1967.
- Turner, L. C. F., *The Coming of the First World War*, Cheshire, Melbourne, 1968.
- Turner, L. C. F., *Origins of the First World War*, Arnold, London, 1970.
- Young Hum Kim, *Twenty Years of Crisis: The Cold War Era*, Prentice-Hall, Englewood N.J., 1968.

3407 History III

Lecture 58 hr
Tutorial 29 hr

The course is divided into two sections of equal weight—India, China and South East Asia 1905–1965, and Twentieth Century Australia.

Part I—India, China and South East Asia, 1905–1965.

A brief introductory survey of the origins and course of Western imperialism in Asia.

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 1911–1949;
- the Huk movement in the Philippines;
- the Malayan 'Emergency';
- the Viet Minh and Viet Cong.

Part II—Twentieth Century Australia.

Political and social trends in Australia 1901–1966 and Australia's foreign relations during the period.

Australia's role in the two World Wars.

RECOMMENDED TEXTS

Part I

- Brecher, M., *The New States of Asia: A Political Analysis*, O.U.P., London, 1963.
- Fitzgerald, C. P., *The Birth of Communist China*, Penguin, London, 1964.
- Mao Tse Tung, *Basic Tactics*, Cassell, London, 1967.
- Michael, F. H. and Taylor, G. E., *The Far East in the Modern World*, rev. ed., Methuen, London, 1964.
- O'Malley, L. S. S. (ed.), *Modern India and the West*, O.U.P., London, 1968.
- O'Neill, R. J., *Indo-China Tragedy 1945–1954*, Cheshire, Melbourne, 1968.
- O'Neill, R. J., *General Giap—Politician and Strategist*, Cassell, Melbourne, 1969.
- Pomeroy, W. J. (ed.), *Guerilla Warfare and Marxism*, International, New York, 1968.
- Segal, R., *The Crisis of India*, Penguin, London, 1965.

Part II

- Alexander, F., *Australia Since Federation*, Nelson, Melbourne, 1967.
- Bean, C. E. W., *Anzac to Amiens*, Australian War Memorial, Canberra, 1961.
- Esthus, R. A., *From Enmity to Alliance*, Melbourne University Press, 1965.
- Hasluck, P. M. C., *The Government and the People, 1939–41*, Australian War Memorial, Canberra, 1967, reprint.
- Louis, L. and Turner, I., *The Depression of the 1930s*, Cassell, Melbourne, 1968.
- Turner, L. C. F., *Australia Since the Camera*, Vol. III. *The Great War 1914–1918*, Cheshire, Melbourne, 1971.
- Watt, A., *The Evolution of Australian Foreign Policy, 1938–1965*, Cambridge University Press, 1967.

1413 History C

Lectures and Tutorials 84 hr

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

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

Part I

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

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, e.g.: the Western Desert, June–November 1942.

RECOMMENDED TEXTS

Part I

Benns, F. L., *Europe Since 1914 in its World Setting*, 8th ed., Appleton-Century-Crofts, New York, 1954.

Brecher, M., *The New States of Asia*, O.U.P., London, 1963.

Gelber, H. G., *The Coming of the Second World War*, Cheshire, Melbourne, 1967.

Hudson, G. F., *The Hard and Bitter Peace : World Politics since 1945*, Pall Mall, London, 1966.

Michael, F. H., and Taylor, G. E., *The Far East in the Modern World*, rev. ed., Methuen, London, 1964.

Thomson, D., *Europe Since Napoleon*, Longmans, London, 1966.

Turner, L. C. F., *The Coming of the First World War*, Cheshire, Melbourne, 1968.

Part II

Earle, E. M. (ed.), *Makers of Modern Strategy*, Princeton U.P., Princeton, 1943.

Falls, C., *A Hundred Years of War*, Duckworth, London, 1961.

Howard, M. (ed.), *The Theory and Practice of War*, Cassell, London, 1965.

Ropp, T., *War in the Modern World*, Duke U.P., Durham, N.C., 1966.

Turner, L. C. F., *The First World War*, Cheshire, Melbourne, 1970.

Turner, L. C. F., *The American Civil War and Reconstruction 1861–1877*, Cheshire, Melbourne, 1971.

**Department of Language
& Literature**

1507 English I

A course of 84 lectures, with tutorials, on Modern Literature: (i) poetry since Yeats; (ii) drama since Ibsen; (iii) fiction since Joyce.

TEXTS

- (i) M. Mack, L. Dean and W. Frost (edd.), *Modern Poetry*
- (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) Joyce, *Portrait of the Artist as a Young Man*
Greene, *The Power and the Glory*
Waugh, *Sword of Honour*
White, *Riders in the Chariot*
Fitzgerald, *The Great Gatsby*
Faulkner, *The Sound and the Fury; Go Down, Moses*
Malamud, *The Assistant*
Ellison, *Invisible Man*

REFERENCE BOOKS

- Allen, W., *Tradition and Dream*, Penguin.
Cunliffe, M., *The Literature of the United States*, Penguin.
Ford, B. (ed.), *The Modern Age*, Penguin.

2507 English II

A course of 84 lectures, with tutorials, on Romantic and Realist Literature: (i) poetry from Blake to Hopkins; (ii) English fiction, principally of the nineteenth century; (iii) American and Continental fiction.

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. Story)
Matthiessen, F. O. (ed.), *Oxford Book of American Verse*
- (ii) Scott, *The Heart of Midlothian*
Jane Austen, *Northanger Abbey*
Dickens, *Bleak House*
George Eliot, *Middlemarch*
James, *The American; The Europeans*
Conrad, *Nostramo*
Hardy, *Tess of the d'Urbervilles; Far from the Madding Crowd*
- (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*
Tolstoy, *Anna Karenina*
Dostoevsky, *Crime and Punishment*
Flaubert, *Madame Bovary*

REFERENCE BOOKS

- Allen, W., *The English Novel*, Penguin
Cunliffe, M., *The Literature of the United States*, Penguin.
Ford, B. (ed.), *From Blake to Byron*, Penguin.
Ford, B. (ed.), *From Dickens to Hardy*, Penguin.

3507 English III

A course of 84 lectures, with tutorials, on Renaissance, Baroque and Neo-Classical Literature: (i) Tragedy; (ii) Comedy; (iii) Epic; (iv) Romance; (v) Satire; (vi) The Rise of the Novel; (vii) Meta-physical Poetry. Lectures will pay special attention to, but will not be confined to: Shakespeare, Marlowe, Jonson; Spenser, Milton, Dryden, Pope; Donne; Swift, Johnson, and Fielding.

1551 English Language

A course of 28 lectures, with tutorials, on the use and history of the English language, both written and spoken.

TEXTS

- Brooks, C., and Warren, R. P., *The Fundamentals of Good Writing*, Dobson.
Barber, C. L., *The Story of Language*, Pan.
Ramson, W. S. (ed.), *English Transported*, A.N.U. Press.

1521 English A

A course of 28 lectures, with tutorials, on the use of English (both written and spoken) as a means of communication, with some attention to technical and scientific writing.

TEXTS

Brooks, C. and Warren, R. P., *The Fundamentals of Good Writing*, Dobson.
Barber, C. L., *The Story of Language*, Pan.
Ramson, W. S. (ed.), *English Transported*, A.N.U. Press.

2521 English B

A course of 28 lectures on modern poetry, drama and fiction.

TEXTS

Mack, M. Dean L. and Frost W. (edd.), *Modern Poetry*.
O'Neill, *The Emperor Jones; Long Day's Journey Into Night*
Williams, *A Streetcar Named Desire*.
Miller, *Death of a Salesman*.
Crane, *The Red Badge of Courage*.
Hemingway, *The Sun Also Rises*.
Snow, *The New Men*.

Department of Mathematics

1105 Mathematics I

Lectures 140 hr

Tutorials 56 hr

196 hr

PRE-REQUISITE

A pass in Mathematics at the first or second level full course in New South Wales, or the equivalent as prescribed for the Faculties of Applied Science and Science.

OUTLINE OF COURSE

(a) *Calculus and Analysis*

Functions, graphs, limits, continuity. Cartesian and polar coordinates in the plane. Differential calculus for functions of a single real variable, usual applications. The elementary functions and properties. The concept of an integral, and application to geometrical and physical contexts, including improper and infinite integrals. Techniques of integration. Sum of series, introduction to convergence, power series for elementary functions.

(b) *Vectors*

Vector quantities and their algebra, including scalar, vector and triple products. Applications to include vector geometry of lines and planes.

(c) *Complex Numbers*

Algebra, geometry of z -plane, de Moivre's theorem and applications. Complex functions of a single real variable and their calculus. The exponential form e^{it} . Parametric equations for plane curves, applications.

(d) *Introduction to Modern Algebra*

Examples of fields, ordered fields, group structure, set notation, Boolean algebra.

(e) *Linear Algebra*

Systems of equations, vector spaces, matrix notation, determinants.

(f) *Differential Equations*

Ordinary differential equations of first order and first degree, applications.

(g) *Digital Computing*

EXAMINATIONS

Annual examinations prescribed by the Department, together with tests and assignments during the year.

Department of Mathematics

RECOMMENDED TEXTS

- Hille, E., and Salas, S., *First Year Calculus*, Blaisdell, 1968.
Spiegel, M. R., *Theory and Problems of Vector Analysis*, Schaum Publishing Co., New York, 1959.
Green, S. L., *Introduction to Differential Equations*, University Tutorial Press, 1961.
Blatt, John M., *Basic Fortran IV Programming*, Computer Systems, Sydney, 1969.

REFERENCE BOOKS

- Macbeath, A. M., *Elementary Vector Algebra*, Oxford University Press, 1964.
Thomas, G. B., *Calculus and Analytical Geometry*, Addison-Wesley.
Birkoff and McLane, *Survey of Modern Algebra*, Macmillan, New York.
Courant, R., *Differential and Integral Calculus*, Vol. I., Blackie & Sons.

2103 Mathematics II

<i>Lectures</i>	112 hr
<i>Tutorials</i>	84 hr
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	196 hr

OUTLINE OF COURSE

(a) *Calculus and Analysis*

Mean value theorems, Taylor's theorems. Convergence of series, power series. Taylor expansion, operations with power series. Differential calculus for functions of several variables, Jacobians, transformations, spherical and cylindrical polar co-ordinates, composite functions. Taylor series for functions of several variables, critical points, constrained maxima and minima. Total differentials, conditions for exact differential, implicit functions. Line, area, volume, and surface integrals, usual applications, change of variable in multiple integrals.

(b) *Vectors and Vector Fields*

Scalar fields, directional derivative, level surfaces, gradient, divergence, curl, physical interpretation, potential, curvilinear co-ordinates, Gauss' and Stokes' theorems. Vector differential calculus, and application to Newtonian dynamics.

(c) *Statistical Methods and Numerical Methods*

Elementary probability, practice in basic statistical procedures, introduction to numerical methods.

(d) *Introduction to Matrix Algebra*

Special types of matrices, inversion of matrices, eigenvalues, applications.

(e) *Elementary Functions of a Complex Variable*

(f) *Ordinary Differential Equations*

Linear with constant co-efficients, Cauchy equations, operator methods, reduction of order, variation of parameters, applications to vibrations and circuits, series solutions, introduction to Laplace transforms and initial value problems.

(g) *Partial Differential Equations*

Fourier series, Bessel and Legendre functions, solution of partial differential equations by separation of variables.

EXAMINATIONS

Annual examinations prescribed by the Department, together with tests and assignments during the year.

RECOMMENDED TEXTS

Protter and Morrey, *Modern Mathematical Analysis*, Addison-Wesley, 1964.

Keyzig, E., *Advanced Engineering Mathematics*, Wiley and Sons, 1964.

Lambe and Tranter, *Differential Equations for Engineers and Scientists*, E.U.P., 1961.

Stephenson, *Mathematical Methods for Science Students*, Longmans, 1961.

REFERENCE BOOKS

Hildebrand, F. B., *Advanced Calculus for Applications*, Prentice-Hall, 1963.

Walpole, R. E., *Introduction to Statistics*, Macmillan, New York, 1968.

Miller, K. S., *Partial Differential Equations in Engineering Problems*, Prentice-Hall, 1959.

Jaeger, J. C., *An Introduction to Applied Mathematics*, Clarendon Press, 1956.

Sokolnikoff and Redheffer, *Mathematics of Physics and Modern Engineering*, McGraw-Hill, 1966.

Beckett and Hurt, *Numerical Calculations and Algorithms*, McGraw-Hill, 1967.

Gaskell, R. E., *Engineering Mathematics*, Staples Press, 1960.

2113 Mathematics II

Lectures 112 hr
Tutorials 56 hr

168 hr

OUTLINE OF COURSE

(a) *Calculus and Analysis*

Infinite series, mean value theorems, Taylor series. Functions of several variables, multiple integrals, curves and surfaces.

(b) *Differential Equations*

First order ordinary differential equations, linear differential equations with constant co-efficients, series solutions.

(c) *Linear Algebra*

Matrix algebra, vector spaces, applications to quadratic forms and three dimensional geometry.

(d) *Introduction to Statistics*

Probability, treatment of data, random variable, distributions, sampling theory, estimation theory, hypothesis testing, regression and correlation, analysis of variation.

EXAMINATIONS

Annual examinations prescribed by the Department, together with tests and assignments during the year.

RECOMMENDED TEXTS

- Protter and Morrey, *Modern Mathematical Analysis*, Addison Wesley, 1964.
Green, S. L., *Introduction to Differential Equations*, University Tutorial Press, 1961.
Hohn, F. E., *Elementary Matrix Algebra*, 2nd ed., Macmillan Co., New York 1964.
Walpole, R. E., *Introduction to Statistics*, Macmillan Co., New York 1968.

2175 Mathematics IIE

Lecture 140 hr
Tutorial 56 hr

196 hr

OUTLINE OF COURSE

Mean value theorems, Taylor's theorem. Convergence of series, power series. Taylor series, operation with power series, application to compilation of tables and evaluation of definite integrals.

Differential calculus of functions of several variables, curves and surfaces. Taylor series, critical points, differentials, conditions for exact differential, implicit functions, plane polar, spherical, and cylindrical coordinates.

Line, area, volume, surface integrals with application to volumes, mass distributions, moments of inertia, work, energy, fluid flow, heat transfer.

Introduction to matrix algebra; special types of matrices, inversion of matrices, eigen values, applications.

Scalar and vector fields, level surfaces, directional derivatives, gradient, conservative fields and potential, divergence and curl, Stokes' and Gauss' theorems.

Ordinary linear differential equations with constant coefficients and applications. Partial differential equations; solution by separation of the variables. Finite differences; application to solution of differential and partial differential equations. Relaxation methods.

Fourier series, Bessel and Legendre functions.

Elementary functions of a complex variable.

Intercept charts; nomograms. Solution of equations by iteration methods using tabular form.

Elementary statistical methods, processing errors, statistical data.

EXAMINATIONS

Annual examinations prescribed by the Department, together with tests and assignments during the year.

RECOMMENDED TEXTS

Green, *Introduction to Differential Equations*, Uni. Tut. Press, 1961.
Sokolnikoff and Sokolnikoff, *Higher Mathematics for Engineers*, McGraw-Hill, 1941.

Kreysig, *Advanced Engineering Mathematics*, Wiley, 1968.

Southworth and Deheevw, *Digital Computation and Numerical Methods*, McGraw-Hill.

Spiegel, *Applied Differential Equations*, Prentice-Hall, 1958.

Spiegel, *Vector Analysis*, Schaum Outline Series, 1959.

3103 Mathematics III

Lectures 168 hr

Tutorials 168 hr

336 hr

OUTLINE OF COURSE

Topics amounting to *twelve units* will be selected from the following list. Each topic will count for *two units* and some of them will be arranged so that the first half can be taken as a *one unit* topic.

- (a) Mathematical methods.
- (b) Probability and mathematical statistics.

Department of Mathematics

- (c) Operations research.
- (d) Fluid dynamics.
- (e) Newtonian dynamics, exterior ballistics and special relativity.
- (f) Integral transforms.
- (g) Matrices and linear algebra.
- (h) Boundary value problems.
- (i) Complex variable.
- (j) Numerical methods.
- (k) Computer applications.
- (l) Programming systems.

EXAMINATIONS

Annual examinations prescribed by the Department, together with tests and assignments during the year.

3113 Mathematics III

Lectures 112 hr
Tutorials 112 hr

224 hr

OUTLINE OF COURSE

Topics amounting to *eight units* will be selected from the following list. Each topic will count for *two units* and some of them will be arranged so that the first half can be taken as a *one unit* topic. At least *one unit* must be chosen from each of topics (a), (g), (i), (j).

- (a) Mathematical methods.
- (b) Probability and mathematical statistics.
- (c) Operations research.
- (d) Fluid dynamics.
- (e) Newtonian dynamics, exterior ballistics and special relativity.
- (f) Integral transforms.
- (g) Matrices and linear algebra.
- (h) Boundary value problems.
- (i) Complex variable.
- (j) Numerical methods.
- (k) Computer applications.
- (l) Programming systems.

EXAMINATIONS

Annual examinations prescribed by the Department, together with tests and assignments during the year.

3141 Mathematics III E

Lecture 84 hr
 Tutorial 28 hr

 112 hr

OUTLINE OF COURSE

Topics amounting to four units to be selected from the list given for 3103 Mathematics III.

EXAMINATIONS

Annual examinations prescribed by the Department, together with tests and assignments during the year.

3171 Mathematics III E

Lecture 28 hr
 Tutorial 28 hr

 56 hr

OUTLINE OF COURSE

Functions of a Complex Variable : Differentiation and integration. Cauchy's theorem. Taylor's theorem. Singularities. Residue theorem and applications including inversion of Laplace transformation. Conformal mapping. Laplace transform method of solving ordinary differential equations; the convolution integral for the Laplace transform: application of the Laplace transform to simple electric circuit and mechanical problems. Introduction to the theory of probability; discrete and continuous probability distributions. The t , F and chi-square tests. Elementary regression analysis. Analysis of variance.

EXAMINATIONS

Annual examinations prescribed by the Department, together with tests and assignments during the year.

RECOMMENDED TEXTS

Kreyszig, *Advanced Engineering Mathematics*, Wiley and Sons, 1964.

Walpole, *Introduction to Statistics*, Macmillan, New York, 1968.

Churchill, *Introduction to Complex Variables and Applications*.

Department of Physics

1203 Physics I

<i>Lectures</i>	84 hr
<i>Practical</i>	84 hr
<i>Tutorials</i>	28 hr
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	196 hr
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General Physics

The definition, and scope, of physics. Physical quantities, systems of units, dimensional analysis. Kinematics, Newton's laws of motion. Kepler's laws. Newton's law of gravitation, gravitational field. Impulse and momentum, conservation. Work, energy, power, conservation of energy. Collisions. Simple harmonic motion. Rotational dynamics, moment of inertia, radius of gyration, conservation of angular momentum, precession.

Properties of Matter

Hydrostatics. Pressure, barometry. Hydrodynamics, Bernoulli's theorem. Viscosity. Surface tension. Elasticity, elastic moduli, Poisson's ratio.

Heat

Temperature, thermometry. Heat capacity. First law of thermodynamics. Calorimetry. Atomic heat of solids. Kinetic theory. Non-ideal gases. Van der Waal's equation. Isotherms. Conduction and radiation of heat. Pyrometers.

Wave Motion and Optics

Progressive and stationary waves. Superposition of waves. Doppler effect. Resonance. Huygen's principle. Reflection, refraction, interference and diffraction of waves. Electromagnetic spectrum. Polarisation.

Electricity and Magnetism

Gauss' theorem. Electric intensity and induction. Capacitance. Electromagnetism. Biot-Savart and Ampere's laws. Force on moving charge and on conductor. Torque on coil. D.C. instruments. Electromagnetic induction. Faraday's and Lenz' Laws, self and mutual inductance, magnetic materials. D.C. circuits, Kirchoff's rules, measurement of resistance and of potential difference. Growth and decay of current.

Atomic and Nuclear Physics

Measurement of specific charge and absolute charge. Natural and artificial radioactivity. Quantum properties of radiation. The Bohr atom. Wave properties of matter. The uncertainty principle. The neutron. Nuclear fission and fusion.

RECOMMENDED TEXTS

- Weidner and Sells, *Elementary Classical Physics*, Vols. I and II, Allyn & Bacon, 1965.
Halliday and Resnick, *Physics—Student Study Guide with Programmed Problems*, Parts I and II, Wiley, 1970.

REFERENCE BOOKS

- Halliday and Resnick, *Physics for Students of Science and Engineering*, Wiley, 1967.
Weidner and Sells, *Elementary Modern Physics*, Allyn & Bacon, 1960.
Richards, Sears, Wehr and Zemansky, *Modern University Physics*, Addison-Wesley, 1960.
Alonso and Finn, *Fundamental University Physics*, Addison-Wesley, 1967.

2203 Physics II

<i>Lectures</i>	112 hr
<i>Tutorials/Practical</i>	112 hr
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	224 hr
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Thermodynamics, Kinetic Theory of Gases and Statistical Mechanics

Thermodynamics variables and the state of a system. Laws of thermodynamics. Kelvin temperature scale. Entropy. Thermodynamic functions and relations. Phase change. Reversible cell. Adiabatic demagnetisation. Distribution of molecular velocities. Maxwell-Boltzmann statistics. Fermi-Dirac statistics and Bose-Einstein statistics.

Waves and Matter

Harmonic oscillations. Coupled vibrations. Vibrations in solids, specific heat, Einstein model. Wave motion, group velocity, vibrations and waves in continuous and discontinuous media, crystal structure and binding energy, interaction of acoustic, electro-magnetic, and particle waves with regular structures, diffraction, Bragg relationship, resolving power.

Electricity and Magnetism

Electrostatics. Dielectric media. Magnetic effects of steady currents. Electromagnetic induction. Maxwell's electromagnetic equations. Plane electromagnetic waves. Magnetic materials. Linear electric circuits: transient response to step excitation, steady state response to harmonic excitation, amplifiers.

Introduction to Relativity: Atomic and Nuclear Physics

Relativity. Photoelectric effect. The origin of spectra. Excitation and absorption. Wave mechanics. Schrodinger equation. Uncertainty principle. Quantum states. X-ray spectra. Radioactivity, detectors, nuclear spectra. Nuclear reactions.

RECOMMENDED TEXTS

- Constant, *Theoretical Physics* (Thermodynamics, Electromagnetism, Waves, and Particles), Addison-Wesley, 1958.
- Duffin, *Electricity and Magnetism*, McGraw-Hill, 1965.
- Semat, *Introduction to Atomic and Nuclear Physics*, Rinehart, 1960.
- Resnick, *Introduction to Special Relativity*, Wiley, 1968.
- Kittel, *Elementary Solid State Physics*, Wiley, 1964.
- Halliday, *Introductory Nuclear Physics*, 2nd ed., Wiley, 1955.

REFERENCE BOOKS

- Kaplan, *Nuclear Physics*, Addison-Wesley, 1963.
- Richtmeyer, Kennard and Lauritsen, *Introduction to Modern Physics*, McGraw-Hill, 1955.
- Sears, *Thermodynamics, The Kinetic Theory of Gases and Statistical Mechanics*, Addison-Wesley, 1953.
- Livesey, *Atomic and Nuclear Physics*, Blaisdell, 1966.
- Scott, *The Physics of Electricity and Magnetism*, Wiley, 1966.
- Feynman, *Lectures on Physics*, Vol. II, Addison-Wesley, 1964.
- Eisberg, *Fundamentals of Modern Physics*, Wiley, 1961.
- Sears, *Mechanics, Wave Motion and Heat*, Addison-Wesley, 1958.
- Morse, *Thermal Physics*, Benjamin, 1964.
- Weidner and Sells, *Elementary Modern Physics*, Allyn & Bacon, 1960.
- Bitter, *Currents, Fields and Particles*, Chapman and Hall, 1957.
- Harnwell, *Principles of Electricity and Electromagnetism*, McGraw-Hill, 1949.

2273 Physics II

<i>Lecture</i>	98 hr
<i>Tutorial/practical</i>	112 hr
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	210 hr
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SYLLABUS

The course is the same as 2203 Physics II, with the omission of the material on circuit theory.

3203 Physics III

Lectures	140 hr
Laboratory	336 hr
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	476 hr
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OUTLINE OF COURSE

Topics amounting to *twelve units* will be selected from the following list. Topic (a) counts for *three units*, topics (b), (c) and (o) for *two units* each, and each of the remainder for *one unit*.

- (a) Electromagnetic theory.
- (b) Quantum mechanics.
- (c) Physics of the solid state.
- (d) Statistical mechanics.
- (e) Special theory of relativity.
- (f) Electron physics.
- (g) Circuit theory.
- (h) Computer technology.
- (i) Magnetic materials.
- (j) Spectroscopy.
- (k) Nuclear physics.
- (l) Particle physics.
- (m) Plasma physics.
- (n) Ionospheric physics.
- (o) Computing techniques.

3203A Physics IIIA

OUTLINE OF COURSE

Topics amounting to *four units* will be selected from the list appearing under 3203 Physics III.

3203B Physics IIIB

OUTLINE OF COURSE

Topics amounting to *one, two or three units* (depending on the number of units selected from 3303B Chemistry IIIB and 3103B Mathematics IIIB) will be selected from the list appearing under 3203 Physics III.

1805 Science IA

Lectures	112 hr
Demonstration/Tutorials	56 hr
	<hr/>
	168 hr
	<hr/>

This subject is presented by the Departments of Chemistry and Physics.

SYLLABUS

1. Properties of gaseous, liquid and solid systems; colligative properties of solutions; colloids; equilibrium in chemical reactions; thermochemistry; electrochemistry; redox reactions. Electronic structures of atoms and molecules; principles of chemical combination; crystal chemistry. The periodic table of the elements; comparative chemistry of selected groups of elements; nature and chemical applications of radioactivity. Reactions and structure of organic compounds.

2. Particles in motion, Newtonian mechanics, relativity. Properties of matter and the nature of heat. Waves; simple harmonic motion, characteristics of waves, electromagnetic waves, behaviour characteristics of waves, the laws of optics, optical instruments. Electricity and magnetism. Quantum mechanics; black body radiation, the photoelectric effect, the X-ray spectrum; Compton effect; wave properties of moving particles; probability and uncertainty; the nature of an atom. Nuclear physics; radioactivity, nuclear reactions, nuclear structure. Fission, fusion.

3. The nature and history of science, scientific method, science and technology, research and development. Technology in industry.

RECOMMENDED TEXTS

Sienko and Plane, *Chemistry*, 3rd ed., McGraw-Hill, 1966.

Deputy and Rinehart, *Introduction to Organic Chemistry*, Wiley, 1967.

Gibbs (rev. by C. A. Russell), *Organic Chemistry To-day*, Penguin Books, 1970.

Atkins, K. R. *Physics*, Wiley, 1965.

REFERENCE BOOKS

Gamow and Cleveland, *Physics, Foundations and Frontiers*, Prentice Hall, 1960.

Ripley J. A., *The Elements and Structure of the Physical Sciences*, Wiley, 1964.

Holton and Roller, *Foundations of Modern Physical Science*, Addison-Wesley, 1958.

Holton, *Introduction to the Concepts and Theories in Physical Science*, Addison-Wesley, 1953.

Appendix

Commandants of the Royal Military College, 1911-1971

- 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. VOWELS, 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, DSO, OBE, MC, 1970– .

Professors of the Royal Military College, 1911-1967

- 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, 1966–67.
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. MacMULLEN, *Mathematics*, 1961–67.
B. DEMPSEY, *Chemistry*, 1962–67.

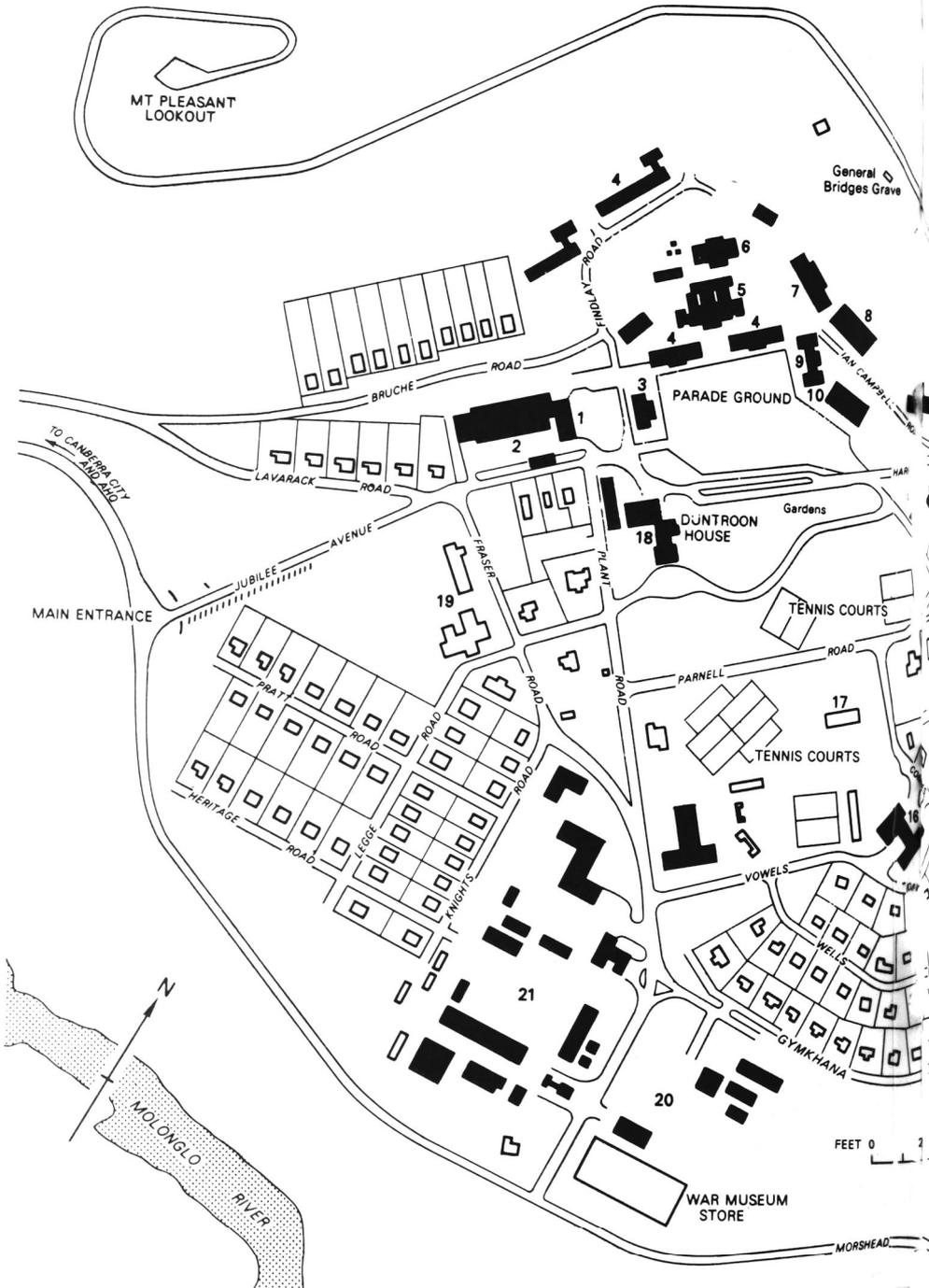
Deans of the Faculty of Military Studies

- Professor Sir Leslie MARTIN, CBE, FAA, FRS, 1967–70.
Professor B. D. BEDDIE, 1971– .

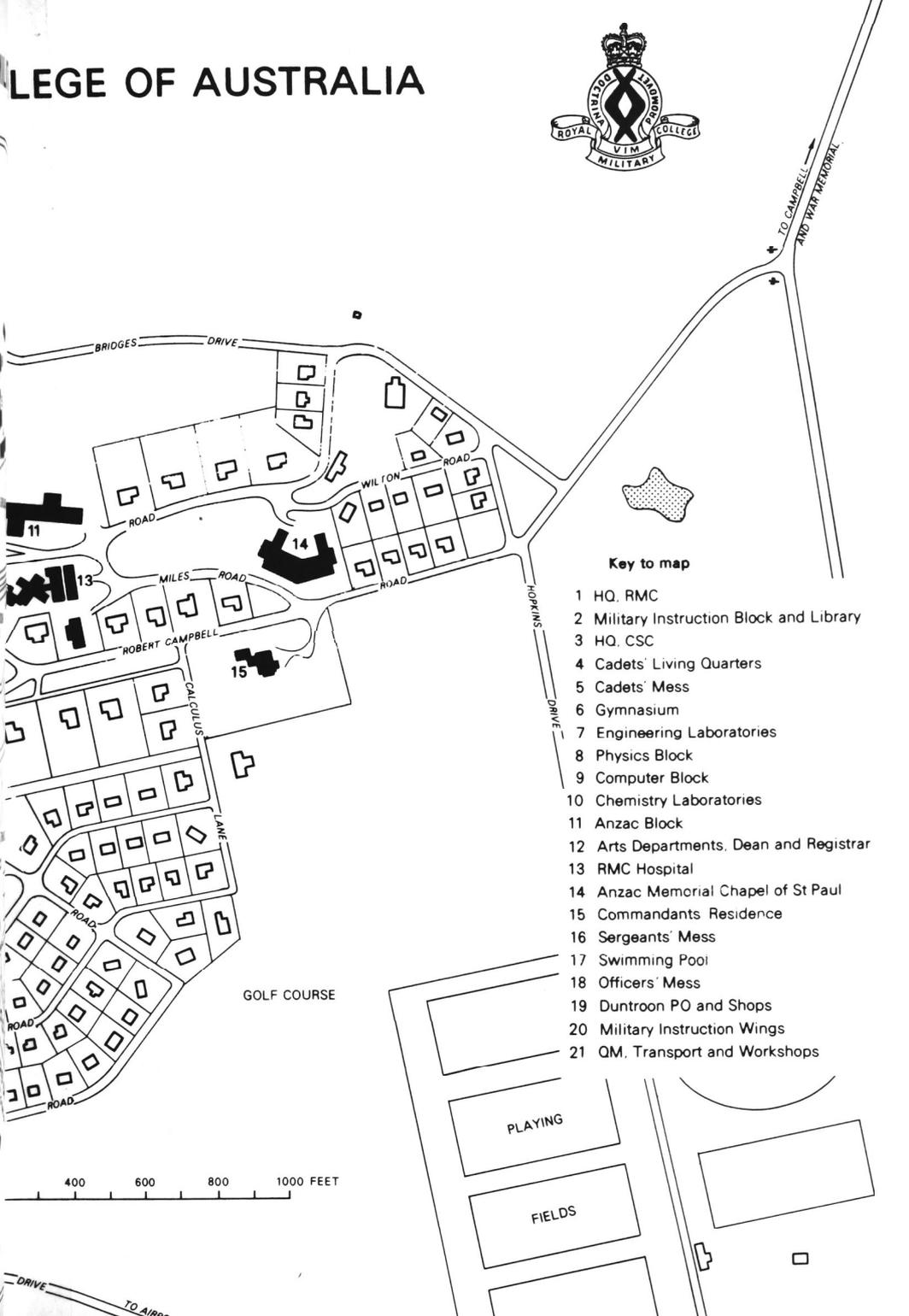
**Directors of Military Art of the Royal Military College,
1911-1971**

- 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. VOWELS, 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. MacNICOL, 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. BLEECHMORE, 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, OBE, 1965–68.
- Colonel M. T. TRIPP, OBE, 1968–70.
- Colonel J. M. MAXWELL, OBE, 1970–

THE ROYAL MILITARY COLLEGE



LEGE OF AUSTRALIA



Key to map

- 1 HQ. RMC
- 2 Military Instruction Block and Library
- 3 HQ. CSC
- 4 Cadets' Living Quarters
- 5 Cadets' Mess
- 6 Gymnasium
- 7 Engineering Laboratories
- 8 Physics Block
- 9 Computer Block
- 10 Chemistry Laboratories
- 11 Anzac Block
- 12 Arts Departments, Dean and Registrar
- 13 RMC Hospital
- 14 Anzac Memorial Chapel of St Paul
- 15 Commandants Residence
- 16 Sergeants' Mess
- 17 Swimming Pool
- 18 Officers' Mess
- 19 Duntroon PO and Shops
- 20 Military Instruction Wings
- 21 QM, Transport and Workshops

GOLF COURSE

400 600 800 1000 FEET

PLAYING

FIELDS

DRIVE TO AIRPORT