National Defence Défense nationale

Canada

Archived Content

Information identified as archived on the Web is for reference, research or recordkeeping purposes. It has not been altered or updated after the date of archiving. Web pages that are archived on the Web are not subject to the Government of Canada Web Standards. As per the Communications Policy of the Government of Canada, you can request alternate formats on the "Contact Us" page.

A-PD-050-007/PH-001

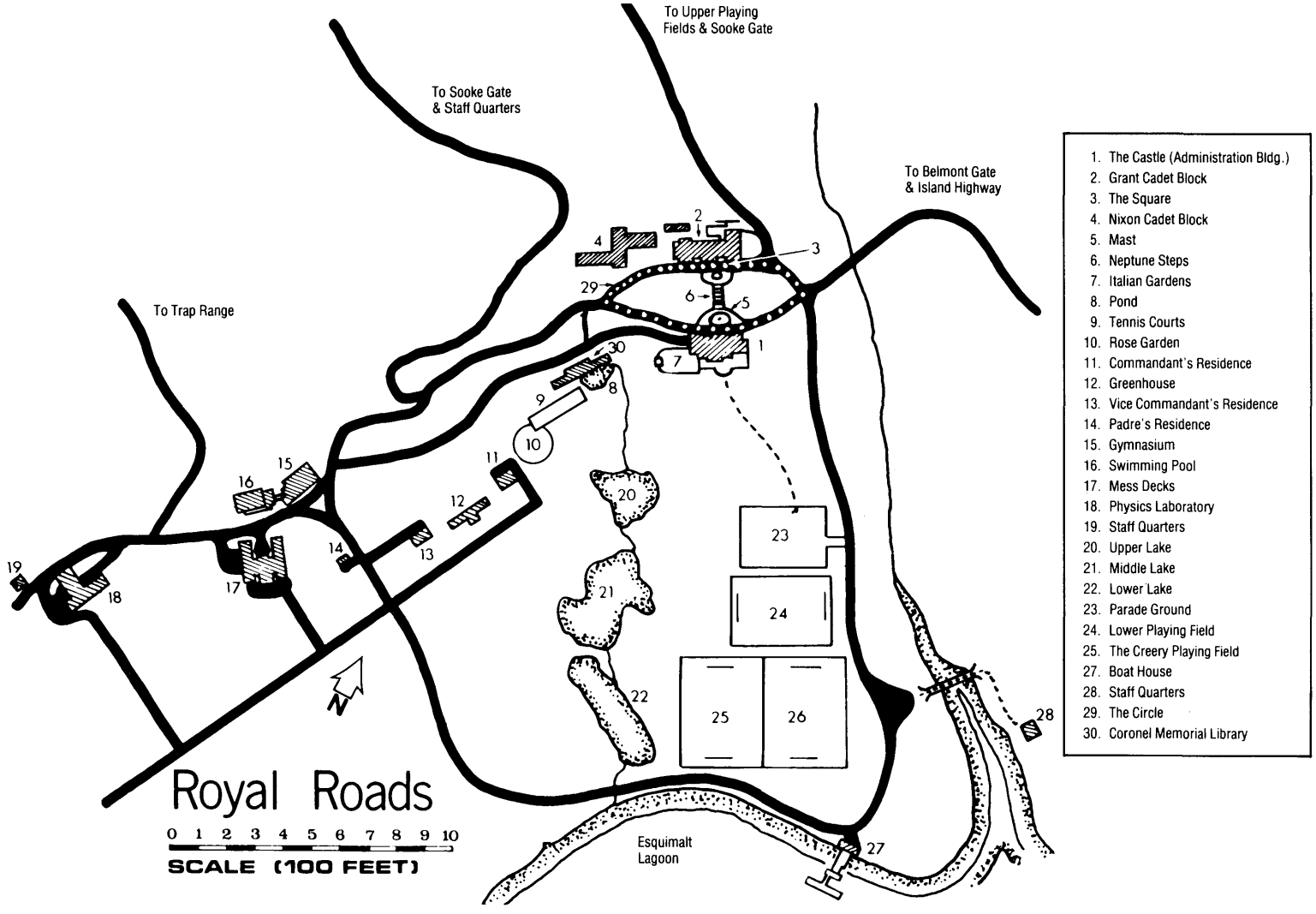
Royal Roads Military College

Calendar 1982-83

Victoria, B.C.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont)


To Upper Playing Fields & Sooke Gate
To Sooke Gate & Staff Quarters
To Belmont Gate & Island Highway
To Trap Range
Esquimalt Lagoon
Royal Roads
0 1 2 3 4 5 6 7 8 9 10
SCALE (100 FEET)
1. The Castle (Administration Bldg.)
2. Grant Cadet Block
3. The Square
4. Nixon Cadet Block
5. Mast
6. Neptune Steps
7. Italian Gardens
8. Pond
9. Tennis Courts
10. Rose Garden
11. Commandant's Residence
12. Greenhouse
13. Vice Commandant's Residence
14. Padre's Residence
15. Gymnasium
16. Swimming Pool
17. Mess Decks
18. Physics Laboratory
19. Staff Quarters
20. Upper Lake
21. Middle Lake
22. Lower Lake
23. Parade Ground
24. Lower Playing Field
25. The Creery Playing Field
27. Boat House
28. Staff Quarters
29. The Circle
30. Coronel Memorial Library

1982

JANUARY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

FEBRUARY

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

MARCH

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

APRIL

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

MAY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

JUNE

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

JULY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

OCTOBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

NOVEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

DECEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

1983

JANUARY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

FEBRUARY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

MARCH

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

APRIL

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

MAY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JUNE

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

JULY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

AUGUST

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

SEPTEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

OCTOBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

NOVEMBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

DECEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

THE ACADEMIC YEAR

CALENDAR OF EVENTS — 1982-83

First Semester

Aug 23	Mon	Cadet Officers return
Aug 27	Fri	BOTC Graduation/Recruits arrive
Aug 28-Sept 1	Sat-Wed	Administration
Sept 1	Wed	Registration and Book Issue
Sept 2	Thurs	Classes start
Oct 8-11	Fri-Mon	Stand down (no classes)
Oct 29	Fri	Mid-semester academic reports due
Dec 3	Fri	Classes end
Dec 6	Mon	Exams start
Dec 14	Tue	Exams end
Dec 16	Thurs	1200 — Results due Registrar
Dec 17	Fri	1000 — Faculty Board/Faculty Council
Dec 17	Fri	Christmas Ball
Dec 18-Jan 2	Sat-Sun	Christmas Leave
Jan 2	Sun	Cadets return
Jan 3-7	Mon-Fri	Military Training
Jan 7-8	Fri-Sat	Supplemental Examinations

Second Semester

Jan 10	Mon	Classes start
Feb 11-14	Fri-Mon	Stand down (no classes)
Feb 25	Fri	Mid-semester academic reports due
Apr 14	Thurs	Classes end
Apr 18-28	Mon-Thurs	Second semester examinations
May 11-13	Wed-Fri	First Year supplemental exams
May 13	Fri	Convocation, Academic Awards, Sunset Ceremony
May 14	Sat	Graduation Parade and Ball
May 15	Sun	Successful cadets to summer duties
May 20-21	Fri-Sat	Senior Years supplemental examinations

CANADIAN MILITARY COLLEGES

ADVISORY BOARD 1982

CHAIRMAN

C.F. Moir, BSc, BEd, MA

VICE-CHAIRMAN

K. Francoeur-Hendriks, BEd, MEd, Adm

REGIONAL DIRECTORS

Lieutenant-Colonel (Retired) J. Denoncourt, CD, BEd, MEd
Commander (Retired) D.M. Johnston, CD, BA, LLB
P.P.M. Meincke, rmc, BSc, MA, PhD

MEMBERS

J.G. Allen, rmc, ptsc, BEng, PEng
Brigadier-General (Retired) J.P.A. Cadieux, CD, rmc, BEng, MSc, MBA, PEng
W.H. Critchley, BSc, MIA, PhD
Captain (N) (R) M.L. Hadley, CD, BA, MA, PhD
J.J. Kinley, CD, BSc, BEng, MSc, PEng
Lieutenant-Colonel (Retired) P.R. Lavallée,
CD, rmc, BA, BEng, Eng
W.E. Ludlow, BSc, BEd, MEd, EdD
E.A. Mansfield, rmc, BA, BEd, PhD (Ed, Adm)
D.H. Robertson
P. Schwartz, BA
C.W. Sharp, LLB
T.A. Somerville, rmc, BEng, PEng
M.M. Soule, rmc, BA, LLB
Colonel (Retired) M. Turner, CD, rmc, psc, BEng, PEng

EX-OFFICIO MEMBERS

Deputy Minister of National Defence
Chief of the Defence Staff
Vice Chief of the Defence Staff
Assistant Deputy Minister (Personnel)
Chief Research and Development

SECRETARY

Major J.P. Van Boeschoten, CD, BA

OFFICERS OF ADMINISTRATION

President — The Minister of National Defence, The Honourable J. Gilles Lamontagne, PC, MP

Commandant — Colonel G.L. Logan, CD, rmc, pfsc, psc, BA(RMC)*

Principal and Director of Studies — E.S. Graham, BSc, MSc (Queen's), PhD (MIT), FSC, FOAS

Vice-Commandant — Commander R.S. Copley, CD, pcsc, BSc (Victoria)

Dean of Science and Engineering —H.J. Duffus, ndc, BA, BASc (Brit Col), DPhil (Oxon), PEng — Professor of Physics

Dean of Arts — W. Rodney, DFC and Bar, BA (Alberta), MA (Cantab), PhD (London), FRGS, FRHistS — Professor of History

Chief Administrative Officer — Major R.W. Kuntz, CD, rmc, pfsc, BSc (RMC), MBA (Ottawa)*

Registrar — Colonel (Ret'd) A.D. Wallis, CD, rmc, psac, BA (RMC), MA (London)*

Assistant Registrar — Captain J.R. DeLong, CD, rmc, plsc, BSc (RMC)*

Chaplains —
Chaplain (P) — Captain E.W. Taylor, BA (McMaster), MA (Cantab), MPhil (Yale), MDiv (Toronto)
Chaplain (RC) — Captain R.J. Paulin

Comptroller and Logistics Officer — Lt(N) J.L. Chow, BSc, BA (Queen's)

Staff Officer Cadets and Military Training — Major P.R. Learmonth, CD, rmc, psc, BA (RMC)*

Squadron Commanders —
Lieutenant (N) P.C. Henderson, cmr, BSc (CMR)
Captain R.N. Hardman, rmc, BA (RMC)*
Captain M.W.T. Haché, rmc, BA (RMC)
Major K.R. Merkley, CD, BA (RMC), MA (Queen's)

Schools Liaison Officer — Captain R.J. Beardmore, CD, rmc, plsc, BEng, (RMC)*

Personnel Administrative Officer — Captain T. McCarthy, CD

Librarian — C.C. Whitlock, B.A. (Sask), BEd (Brit Col), BLS (McG)

Assistant Librarian — Susan E. Day, BA (Queen's), MLS (Toronto)

Director of Athletics — Captain K.M. Benoit, CD, rmc, BSc (RMC)*

Physical Education and Recreation Officer — Captain H.R. Schilds, CD

University Liaison Officers —
Major J.S. Maki, CD
Captain D.L. Browne, CD

EMERITI

C.C. Cook, BA, MSc, LLD, Emeritus Professor of Physics (1961)

C.S. Burchill, BA, MA, BSc, Emeritus Professor of History (1971)

J.M.C. Meiklejohn, MBE, BSc, Registrar Emeritus (1972)

A.E. Carlsen, BA, MA, PhD, Emeritus Professor of Economics (1974)

H.R. Grigg, BSc, MSc, PhD, Emeritus Professor of Physics (1978)

G.F. Dalsin, BSc, MA, Emeritus Professor of Mathematics (1978)

W.G. McIntosh, BSc, PEng, Emeritus Professor of Engineering (1978)

A.G. Bricknell, BSc, MSc, PhD, CChem, ARCS, FCIC, Emeritus Dean of Science (1979)

R. Oldham, DFC, Croix de Guerre et Palme, BA, MA, PhD, Emeritus Dean of Arts (1979)

B. Aghassian, MA, Emeritus Professor of French (1979)

J.A. Izard, BEng, MASc, PEng, Emeritus Professor of Engineering

D.W. Hone, BA, PhD, Emeritus Professor of Physics (1981)

J.K. Kinnear, BA, MA, Emeritus Professor of Physics (1981)

H. Montgomery, BA, MA, PhD, FCIC, Emeritus Professor of Chemistry (1982)

OFFICERS OF INSTRUCTION

A. Allard, BA (Brit Col) MA (Berkley), Instructor in French

W. Babinchuk, BSc (Sask), MSc (Brit Col), Assistant Professor of Mathematics

M.R. Barr, BSc, MSc, PhD (Brit Col), MCIC, Associate Professor and Head of the Department of Chemistry

G.M. Barrow, BASc, MASc (Brit Col), PhD, (Berkley), Assistant Professor of Chemistry

J.A. Bayer, BA (Brit Col), MA (Carleton), PhD (London), Assistant Professor of Political Science

C. Bordeleau-Zenko, BA (Sherbrooke), Instructor in French

J.A. Boutilier, BA (Dalhousie), MA (McMaster), PhD (London), Associate Professor and Head of the Department of History and Political Economy

Major G.W.S. Brodsky, CD, BA (Queen's), MA (Victoria), Special Lecturer in English

E.R. Chappell, rmc, BSc (Queen's), MASc (Brit Col), MEIC, MCSCE, MCASI, PEng, Associate Professor of Engineering and Head of the Department of Engineering*

Captain D.L. Christensen, rmc, BSc (RMC), Special Lecturer in Mathematics*

J.S. Collins, BSc (Dalhousie), BEng, MEng (NSTechColl), PhD (Washington), MIEEE, MEIC, MCSEE, PEng, Assistant Professor of Engineering

H.J. Duffus, ndc, BA, BASc, (Brit Col), DPhil (Oxon), PEng, Professor of Physics and Dean of Science and Engineering

P.J.S. Dunnett, BSc (Bradford), MA, PhD, (SFU), Associate Professor of Economics

J.M. Gilliland, BSc, MA (Brit Col), PhD (Alberta), Assistant Professor of Physics

E.S. Graham, BSc, MSc (Queen's), PhD (MIT), FCS, FOAS, Professor of Chemistry and Principal and Director of Studies

A. Hadley, BA (Brit Col), DipEd (Victoria), Instructor in French

N.S. Ho, BSc (Taiwan), MA, PhD (Toronto), Assistant Professor in Physics

D.B. Kerrighan, BSc, PhD (Waterloo), Assistant Professor of Mathematics

D.P. Krauel, BSc (McMaster), MSc (Dalhousie), PhD (Liverpool), Associate Professor and Head of the Department of Physics

G.M. Lancaster, BSc (Liverpool), PhD (Sask), Professor and Head of the Department of Mathematics

J. Landry, BA (Montreal), DipEd (McGill), Instructor in French

Major D.L. Lang, CD, BA, BEd (St. F of X), MA (Queen's), Special Lecturer and Head of the Department of Military Leadership and Management

Major S.E. Lipin, CD, rmc, BEng (RMC), MSc (Brit Col), Special Lecturer in Chemistry*

W.T. MacFarlane, BA (Sask), MSc (Alberta), PhD (Oregon State), Associate Professor of Physics

J.W. Madill, CD, BSc (CE) (Manitoba), MSc (CE) (Queen's), EdD, (WVU), MEIC, MCGS, MCSCE, PEng, Associate Professor of Engineering

M.S. Madoff, AB (Michigan), PhD (Brit Col), Assistant Professor of English

W.T. Mann, BComm (Brit Col), FCGA, Part-time Visiting Professor of Accounting

R.F. Marsden, rmc, BSc (RMC), PhD (Brit Col), Assistant Professor of Physics

G.A. Martel, BA (SFU), MA (Fletcher), PhD (Toronto), Assistant Professor of History

Major K.R. Merkley, CD, BA, (RMC), MA (Queen's), Visiting Special Lecturer in History and Political Economy

F. Menard, BA (Montreal), Instructor in French

F. Milinazzo, BSc, PhD (Brit Col), Assistant Professor of Mathematics, (on leave of absence 1981-83 - California Institute of Technology)

G. Morgan, BA (Loyola), MA (Phil), MA (Lit), PhD (Montreal), MNI, CMMC, Professor and Head of the Department of English and Philosophy

C. Plows, BA (Montreal), Instructor in French

Captain M. Plul, CD, BA, BEd (Ottawa), MSW (Brit Col), Special Lecturer in Military Leadership and Management

M.J. Press, BSc, MSc, (McG), PhD (SFU), Associate Professor of Physics

C.N. Ramkeesoon, BA (U of Wales), MA (Dalhousie), PhD (Western), Assistant Professor of French

K.J Reimer, BSc, MSc (Calgary), PhD (Western), MCIC, Assistant Professor of Chemistry

J. Robichaud, BA (Edmunston), BAEd (Montreal), Licence théologie (Laval), Instructor in French

M.G. Robinson, BSc, PhD (Dunelm), Associate Professor of Chemistry

SENIOR STAFF

W. Rodney, DFC and Bar, BA (Alberta), MA (Cantab), PhD (London), FRGS, FRHistS, Professor of History, Dean of Arts

P.J. Schurer, BSc, MSc, PhD (Groningen), Assistant Professor of Physics

P. Smart, BEd, BSc (Alberta), MEd (Brit Col), MPA (Victoria), PhD (Walden), Assistant Professor of Mathematics (on leave of absence 1982-83)

R.C. Snell, BSc, MSc (Queen's), PhD (Brit Col), Associate Professor of Mathematics

C. Tchalekian, BSc, MA (Iowa), PhD (Texas), Associate Professor and Head of the Department of French

A. Tétreault, BA (Montreal), Instructor in French

J. VanCampen, BA, BSW (Laval), MA Linguistics (SFU), Instructor in French

Colonel (Ret'd) A.D. Wallis, CD, rmc, psac, BA (RMC), MA (London), Professor of Political Science and Registrar*

M.J. Wilmut, ndc, BSc (Sir George Williams), MA, PhD (Queen's), Associate Professor of Mathematics

W.W. Wolfe, BSc (Brandon), MSc, PhD (Queen's), Associate Professor of Mathematics

S.D. Wray, BSc (Adelaide), BSc (Hons), MSc, PhD (Flinders), Assistant Professor of Mathematics

*Graduate Royal Roads

SENATE

The Minister of National Defence (Chancellor of the College and President of the Canadian Military Colleges), the Commandant (Vice-Chancellor and Chairman), the Principal and Director of Studies, the Dean of Science and Engineering, the Dean of Arts, the Registrar (Secretary), Dr. J.A. Boutilier (term expires 31 May 1983), Dr. D.P. Krauel (term expires 31 May 1984), M.G. Robinson (term expires 31 May 1985).

The Director of the RRMC Regional Sub-Committee of the Canadian Military Colleges Advisory Board and the Vice-Commandant of the College may attend meetings of the Senate.

COMMITTEES

THE COLLEGE COUNCIL

The Commandant *(Chairman)*, the Principal and Director of Studies, the Vice-Commandant, the Dean of Science and Engineering, the Dean of Arts, the Registrar *(Secretary)*, the Head of the Department of Engineering, the Staff Officer Cadets and Military Training, and the Chief Administrative Officer.

THE FACULTY COUNCIL

The Principal and Director of Studies *(Chairman)*, the Vice-Commandant, the Dean of Science and Engineering, the Dean of Arts, the Staff Officer Cadets and Military Training, the heads of the departments of Chemistry, Engineering, English and Philosophy, French, History and Political Economy, Mathematics, Military Leadership and Management, Physics, as well as the Chief Librarian, the ADP Manager, and the Registrar *(Secretary)*.

THE FACULTY BOARD

The Principal and Director of Studies *(Chairman)*, the Vice-Commandant, faculty members of the rank of lecturer and above, the officers of the military wing, the Chief Librarian, the Chief Administrative Officer, and the Registrar *(Secretary)*.

AD HOC COMMITTEES

THE LIBRARY COMMITTEE

M.R. Barr, S.E. Day (Secretary), J.M. Gilliland, E.S. Graham (ex officio), R.W. Kuntz, D.L. Lang, J.W. Madill, M.S. Madoff, G.A. Martel, C.N. Ramkeesoon, W. Rodney (Chairman), C.C. Whitlock, M.J. Wilmut.

THE PICTURES AND RELICS COMMITTEE

J.R. DeLong, J. Gilliland, E.W. Taylor (Secretary and Curator), C.C. Whitlock (Chairman) and one cadet appointed by the Vice-Commandant.

THE CADET ACADEMIC ADVISORS

a. First Year Cadets. J.A. Boutilier (Champlain Flight), E.S. Graham (MacKenzie Flight), M.S. Madoff (LaSalle Flight), K.J. Reimer (Hudson Flight), P. Schurer (Cartier Flight), M.J. Wilmut (Fraser Flight), W.W. Wolfe (First Year UTPM Cadets).

b. Second Year Cadets. M.R. Barr (General Science), E.R. Chappell and J.W. Madill (Engineering), G.M. Lancaster (Honours Science and Engineering Physics), G.A. Morgan and W. Rodney (Arts/Administration).

c. Third Year Cadets. D.P. Krauel (Oceanography), R.C. Snell (Computing Science), J.A. Bayer (Arts).

d. Fourth Year Cadets, M.J. Press (Oceanography), P.J.S. Dunnett (Arts).

THE LECTURESHIPS COMMITTEE

J.A. Boutilier, G.W.S. Brodsky, J.S. Collins, R.N. Hardman, A.G. Martel, D.P. Krauel, D.L. Lang, and K.J. Reimer (Chairman).

THE ARTS RESEARCH GRANTS COMMITTEE

E.S. Graham (ex officio), J.A. Boutilier, G.A. Morgan, W. Rodney (Chairman), M.G. Robinson, A.D. Wallis (Secretary).

THE TRAINING AND RESEARCH AIDS COMMITTEE

M.R. Barr, J.A. Bayer, J.R. DeLong (ex officio), R.N. Hardman, J.M. Gilliland (Secretary), J.W. Madill (Chairman), R.C. Snell S.D. Wray.

THE ADMISSIONS COMMITTEE

M.R. Barr, J.A. Bayer, R.J. Beardmore, K.M. Benoit, E.R. Chappell, R.S. Copley, J.R. DeLong (Secretary), H.J. Duffus, P.J.S. Dunnett, J.M. Gilliland, E.S. Graham, M.W.T. Haché, R.N. Hardman, P.C. Henderson, B. Kerrighan, G.M. Lancaster, D.L. Lang, P.R. Learmonth, G.L. Logan, W.T. MacFarlane, J.W. Madill, M.S. Madoff, A.G. Martel, C.N. Ramkeesoon, M.G. Robinson, W. Rodney, P.J Schurer, H.R. Schilds, R.C. Snell, C. Tchalekian, A.D. Wallis (Chairman), W.W. Wolfe, S.D. Wray.

COMPUTER USERS COMMITTEE

J.S. Collins, S.E. Day, J.R. DeLong, P.J.S. Dunnett, D.P. Krauel, R.W. Kuntz, M.J. Press (Chairman), K.J. Reimer, W.W. Wolfe, and one member of the Cadet Wing (to be appointed).

COMPUTER SCIENCE CURRICULUM COMMITTEE

H.J. Duffus (Chairman), P.J.S. Dunnett, J.S. Collins, M.J. Press, K.J. Reimer, R.C. Snell.

THE FACULTY-CADET ACADEMIC COMMITTEE

The Principal and Director of Studies (Chairman), the heads of the academic departments, the Registrar, the DCWC (Secretary), the CFLs of the first slate of cadet officers, a UTPM cadet, and three other cadets.

THE COMMITTEE ON PROMOTIONS AND TENURE

The Principal and Director of Studies (Chairman), and the heads of the academic departments.

THE COMMITTEE ON GRADUATE FELLOWSHIPS

M.R. Barr, J.A. Bayer, E.R. Chappell, H.J. Duffus, M.J. Wilmut (Chairman).

THE CANADIAN MILITARY COLLEGES

ROLE

The role of the Canadian Military Colleges is to educate and train Officer Cadets and commissioned officers for a career of effective service in the Canadian Forces.

OBJECTIVES

The objectives of the Canadian Military Colleges are:

a. to prepare and motivate Officer Cadets for effective service as commissioned officers in the Canadian Forces by —

(1) providing a university-level education in appropriate disciplines designed on a broad base to meet the unique needs of the Forces;

(2) developing qualities of leadership;

(3) developing the ability to communicate in both official languages and to understand the principles of biculturalism;

(4) developing a high standard of personal physical fitness;

(5) stimulating an awareness of the ethic of the military profession; and

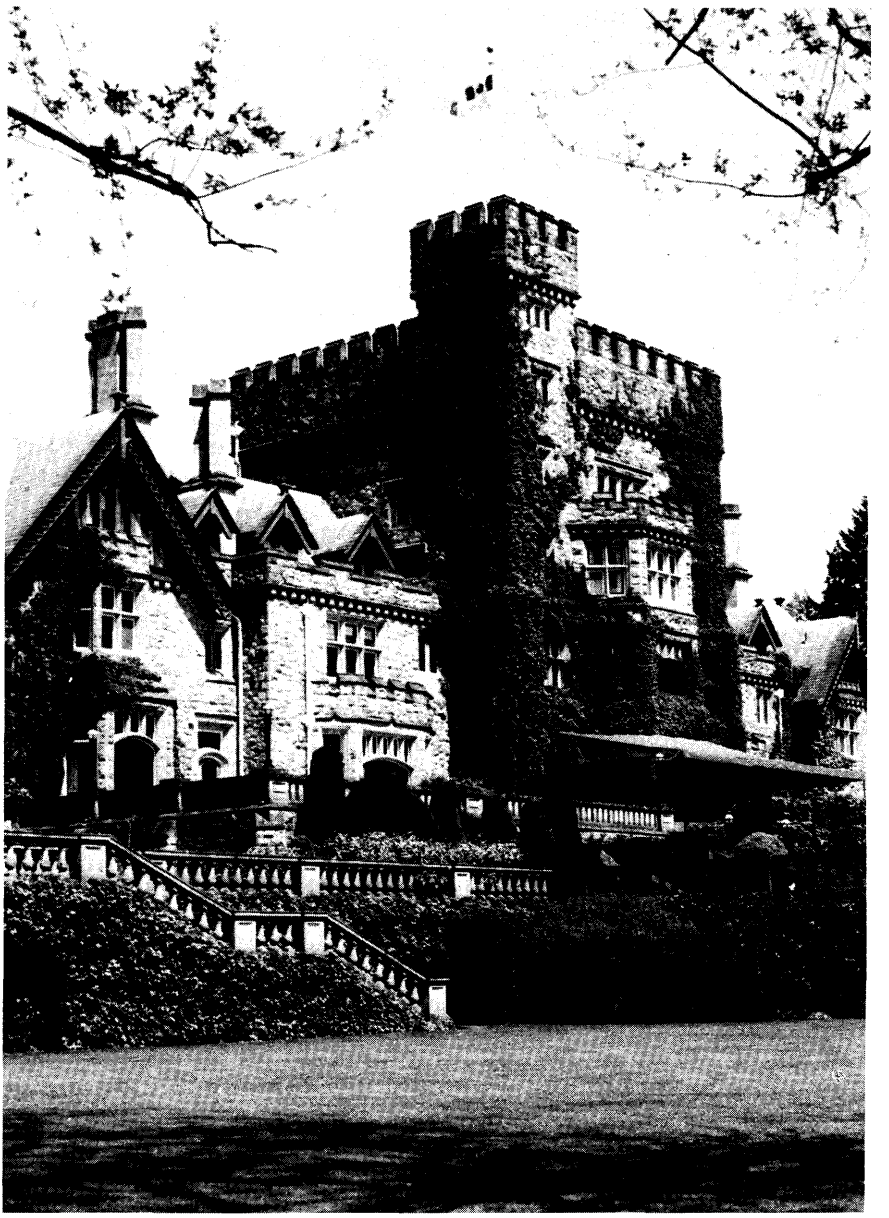
b. to improve the educational background of commissioned officers in the Canadian Forces by providing undergraduate and post-graduate courses in appropriate fields.

ROYAL ROADS MILITARY COLLEGE

HISTORICAL SKETCH

The story of Hatley Park — rechristened Royal Roads from the offshore anchorage in the Straits of Juan de Fuca — has its beginnings in the singleness of purpose and dogged determination of one man. No history of the estate would be complete without some mention of the man in whose mind Hatley Park was conceived and through whose efforts it was brought to birth.

The Honourable James Dunsmuir was born at Fort Vancouver on 8 July 1851, the oldest son of Robert Dunsmuir, a Scottish miner who, at the time of his son's birth, was on his way from Ayrshire to "Vancouver's Island" to prospect for coal. It was not until 1869, however, when James was eighteen years old, that Robert, prospecting on his own, finally struck the rich seam of coal at Wellington, near Departure Bay. He raised sufficient capital, acquired 2,000 acres of land, and started operations which proved so successful that before long he had bought out the other three partners in the venture to become sole owner. During this time, James himself had worked through all the stages of mining and had risen to the position of manager in his father's business. Under his management, the daily output of coal quickly rose from 30 tons to 1,500 tons. After his father's death in 1889, James devoted himself to the development of the collieries at Wellington and Comox, laid out the townsite of Ladysmith, and initiated the Ladysmith-Vancouver ferry service.



HATLEY CASTLE

It was only natural that his prominence in business should lead him into politics. He was elected to the Legislature in 1898 and became Premier in 1900; but, having no taste for public life, he resigned in 1902. He later served a three-year term as Lieutenant-Governor of the Province.

It was during the early years of this century that he purchased the Hatley Park estate comprising about 650 acres. The original Hatley Park house stood on the site that is now the parade ground. This house had been completely destroyed by fire while its owner was in England. Having amassed a huge fortune, James now turned his attention to the building and planning of the new estate to which he intended to retire.

He commissioned Samuel McLure, a Victorian architect, to design the "Castle", and Messrs. Bett and Hall, landscape artists of Boston, Massachusetts, to plan the gardens and surroundings. Local stone, trimmed with Valdez and Saturna Island sandstone, was used in the building's construction. Its impressive exterior is matched only by the lavishness of the interior appointments — oak and rosewood panelled rooms, baronial fireplace, teak floors, and specially made lighting fixtures. James is quoted as saying: "Money doesn't matter — just build what I want." The building is 200 feet long and 86 feet wide; the turret is 82 feet high. The wall surrounding the estate, also built of local stone, cost over $75,000; the Conservatory, costing a like amount, was at one time filled with white orchids imported from India; a large banana tree grew in the centre under the dome. The rooms of the house were filled with flowers from the Conservatory throughout the year. Six miles of road interlaced the estate, and a hundred men were employed in the gardens. There were a number of other buildings on the estate to provide for the needs of the large household, but many of these have now been demolished — the vast refrigeration plant; the cow stables; the slaughter house and smoke house; the three silos, each of 100 ton capacity; the reserve water tank to the south of Belmont Drive; the old stable near the bridge to the east of the present fields; to say nothing of the Chinatown to accommodate 80 to 120 gardeners. There remain, however, the model dairy and the stables, which were of solid brick and concrete construction. The "Castle" was completed in 1908, and the Dunsmuir family took up residence in that year.

Early in 1910, James sold his collieries, his coal rights in the Esquimalt and Nanaimo belt, and all his business connections therewith to Messrs. MacKenzie and Mann, railway promoters, for $11,000,000. He thus separated himself from all former business with which the name of Dunsmuir had been associated. He then retired to enjoy his beautiful home, his yacht "Dolaura", his shooting, fishing, golf, etc. He died in May 1920, at the age of 69. His wife, formerly Laura Surles of Georgia, lived on in Hatley with her daughter Eleanor until she died in August, 1937. Her daughter died six months later.

For the next three years, the estate was left in the hands of a caretaker. In November 1940, it was purchased by the Dominion Government for $75,000 to begin its career as a Naval Training Establishment. No time was lost; early in 1941, HMCS "Royal Roads" was commissioned as an Officer Training Establishment for short-term probationary RCNVR sub-lieutenants and operated as such until October 1942.

During this time, some 600 officers underwent training. In October 1942, after a lapse of 20 years, the training of naval cadets was re-established in Canada, and the spirit of the old Royal Naval College of Canada was reborn in HMCS "Royal Roads".

After a brief history of five years, the Royal Canadian Naval College became, in 1947, the RCN-RCAF Joint Services College. The following year, with the admission of army cadets, Royal Roads became a tri-Service Cadet College, the Canadian Services Colleges Royal Roads. In 1968, the name of the College was changed to Royal Roads Military College.

FACILITIES

The Castle

The Castle was built in 1908. From 1941 until 1943, when Grant Block was completed, it accommodated the cadets of the Royal Canadian Naval College, after being commissioned as HMCS "Royal Roads". It is now the administrative centre of the College. It houses the Commandant, Principal, Vice-Commandant, Registrar and staff, Chief Administrative Officer, Comptroller and Logistics Officer, Personnel Administrative Officer, Staff Officer Cadets, and the University Liaison Officers.

Coronel Memorial Library

The library building was officially opened 1 November 1974 by the late Honorable Walter S. Owen, QC, LLD, former Lieutenant-Governor of British Columbia, and was dedicated to the memory of four members of the First Class of the Royal Naval College of Canada who were lost in action at the Battle off Coronel on 1 November 1914.

Planned by Robert Harrison Associates of Vancouver, B.C., the building was designed to harmonize with its park-like setting, and to be adjacent to Nixon Block, the cadet dormitory. It satisfies both criteria. The library comprises 20,600 square feet, has a capacity of 80,000 volumes and includes 16 faculty offices, a conference room and audio visual facilities for cadets.

The current library collection includes 75,000 bound volumes, a subscription list of over 550 periodicals, and a growing collection of microfilms, recordings, films, and slide transparencies.

Grant Block

Grant Block, completed in 1943, is the centre of all academic instruction. It was named after Captain J.M. Grant, first Commanding Officer of HMCS "Royal Roads".

This building houses a large general chemistry laboratory, capable of accommodating 48 students, and smaller laboratories used for advanced chemistry and chemical or biological oceanography experiments. A Coastal Marine Science Laboratory, an Applied Fluid Dynamics Laboratory, a Dental Clinic, a Medical Inspection and Treatment Area, and the Cadets' dining facilities are also located in this same building.

Computer Systems

The main computer facility for teaching, research and administration at the College currently consists of an IBM 3780 Card Reader/Line Printer Communications terminal and several keyboard terminals connected to Simon Fraser University. A major upgrade is due in late 1982 with the provision of a Honeywell DPS 8/52C mainframe with ten megabytes of memory and 1.3 billion bytes of disc storage. The peripherals will

include about thirty terminals plus two Tektronix 4113 and one 4114 graphics terminals and a Calcomp 1015 plotter.

The College has recently acquired several microcomputer-based systems for use in the Computer Science and laboratories of other teaching disciplines. This equipment includes six Apple IIs, one Apple III, one Commodore Super Pet, one HP 85 and two HP 87s.

Nixon Block

Nixon Block is the accommodation building. It includes about 150 rooms, and also contains common rooms, and a dry canteen. Squadron Commanders' offices are also located in Nixon Block.

This fine building was officially opened by Her Royal Highness Princess Mary, the Princess Royal, on 17 October 1955. It bears the name of the late Commander E.A.E. Nixon, RCN, who was the Commanding Officer of the first Royal Naval College of Canada, situated from 1917-1922 in Halifax, Kingston, and finally in HMC Dockyard, Esquimalt, B.C.

Mess Decks

The Mess Decks originally housed the stables of the estate. It was reconstructed in 1941 and used as accommodation for single members of the ship's company of HMCS "Royal Roads", below commissioned rank. It was also used as classroom space by the cadets before completion of Grant Block.

An indoor rifle range, Non-Commissioned Officers' Mess and the Cadet Gunroom are now located in this building. The Cadet Gunroom consists of a lounge, dance floor and games rooms. In addition, there is also a smaller separate lounge which is used as a "clubhouse" by college sports teams. On Friday nights, the Cadet Gunroom serves as a movie theatre while on Saturday evenings dances are frequently scheduled. The Cadet Gunroom is the centre for cadet social functions at the college.

Swimming Pool

The Pool, built in 1957, measures 23 metres long, 10 metres wide, and 3 1/3 metres at the deep end where there are one-metre and three-metre diving boards. The water circulates through a closed filter system and the temperature is maintained at 25° C.

Physics Building

There have been extensive alterations to two of the original buildings of the Dunsmuir estate. The dairy and cattle barns have now become the physics laboratory area. The physics laboratory comprises a large laboratory room for each of the four years, a number of smaller rooms with special facilities for physical oceanography, and two large research laboratories on the ground level. Little remains of these buildings to betray their humble beginnings as part of the farm facilities on the Dunsmuir estate.

Gymnasium

The physical training centre, built in 1942, is of frame construction. The floor is marked to include basketball (one regulation and two lesser size courts), badminton (three courts), volleyball (two courts), and European team hand ball.

Tennis Courts

There are five asphalt tennis courts for the use of officer cadets during recreational training and on weekends. Two are marked by figure 9 on the Plan of the College, and three are by the Sooke Gate Field.

Squash Courts

Two squash courts are housed within the pool building; both are marked for softball (English) rules of play.

Sports Fields

Within the scenic setting of the College grounds there are three soccer pitches, one rugger field, two ball diamonds, a ¼ mile (400 metres) track, and a 6.1 kilometre cross country course.

Boat House

The boat house and jetty are of comparatively recent construction, replacing the original boat house belonging to the estate, which was located immediately south of the lower lake. This is the centre of all boat pulling and sailing activities. Special orders are published for the use of all boats at the boat house.

OCEANOGRAPHIC RESEARCH VESSEL

The Ta-yut (Chinook Indian dialect meaning Inside-the-Bay) is a thirty-foot fiberglass hulled vessel of Fraser-River-gillnetter design suitably equipped to provide the advanced Oceanography classes with practical experience in acquiring samples and data for laboratory work and research projects. The boat is powered by a 225-hp Volvo inboard-outboard engine, and the installed research equipment includes a hydraulic cable winch for control of sampling equipment, a digital conductivity temperature/depth probe, side-scan sonar, sub-bottom profilers, etc. Data can be processed on board, or electronically recorded for further processing in the laboratory.

OFFICER CADET ORGANIZATION

The Officer Cadets are organized into a wing of four squadrons. This organization controls officer cadet life at the College, within certain limits laid down by the Commandant. Officer Cadets of the second, third, and fourth years hold appointments from Cadet Wing Commander to Cadet Section Commander, and receive practical training in leadership by being responsible, under the guidance of Regular Force officers, for the discipline, progress, and efficiency of the groups under their command. To give as many Officer Cadets as possible an opportunity of receiving this valuable training, the slate of cadet officers is changed during the academic year at the discretion of the Commandant.

Every committee at the College dealing with cadets has strong cadet representation. This gives the representatives an insight into the problems of administering sports and entertainment, including the budgeting of funds.

RECREATION CLUBS AND REP TEAMS

All Officer Cadets take part in a compulsory physical education and intramural sports program. They are also encouraged to participate on one of the College Representative Sports teams and/or to belong to one or more of the College Recreational Clubs.

College Rep teams come under the control of the Director of Athletics. The College participates in the Totem Conference in Basketball, Curling, Volleyball and Soccer and in the Lower Vancouver Island Rugby League. Other College Rep teams such as wrestling, waterpolo, fencing, shooting, cross country running, hockey and sailing compete in various tournaments and invitational events throughout B.C. and the Western United States.

Royal Roads has a variety of Recreational Clubs which are supervised by the College Recreational Council chaired by the Staff Officer Cadets and Military Training (SOC & MT). Each club has an Officer Cadet President who reports to the SOC & MT through the Physical Education and Recreation Officer. College Rec clubs are broken down into two categories as follows

PARA MILITARY	CULTURAL/HOBBY
Alpine Outdoors	Auto
Archery	Camera
CASI	Dance
Flying	Debating
Karate	Radio
Parachuting	Scriblerus
Scuba	War Games
Ski	Sailboarding

Royal Roads also has a College yearbook, the "LOG", and a College newspaper, the "TRICORN", which are published by a committee of Officer Cadets under the supervision of the Senior Staff.

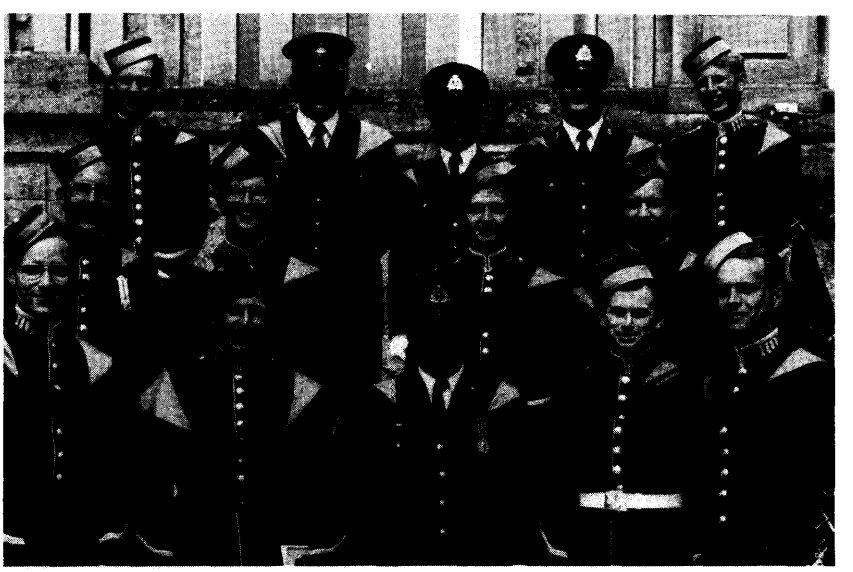
ROYAL ROADS BAND

The Royal Roads band serves two purposes. It serves as a recreational outlet for the musically inclined cadets and also lends itself to performance of a military parade function. Under the direction of a professional musician from the Canadian Forces School of Music, the band provides an excellent opportunity for those cadets with musical ability to continue their training. Although some musical experience is desirable, many cadets have joined with little knowledge of music and have now learned to play an instrument well. The musical facilities and music library at Royal Roads enable the cadet band to perform at parades, mess dinners, and concerts. Recent off-shoots of the band include a stage band, a rock band, and a 15-piece pipe band. Any cadet with musical training is strongly encouraged to join this group.

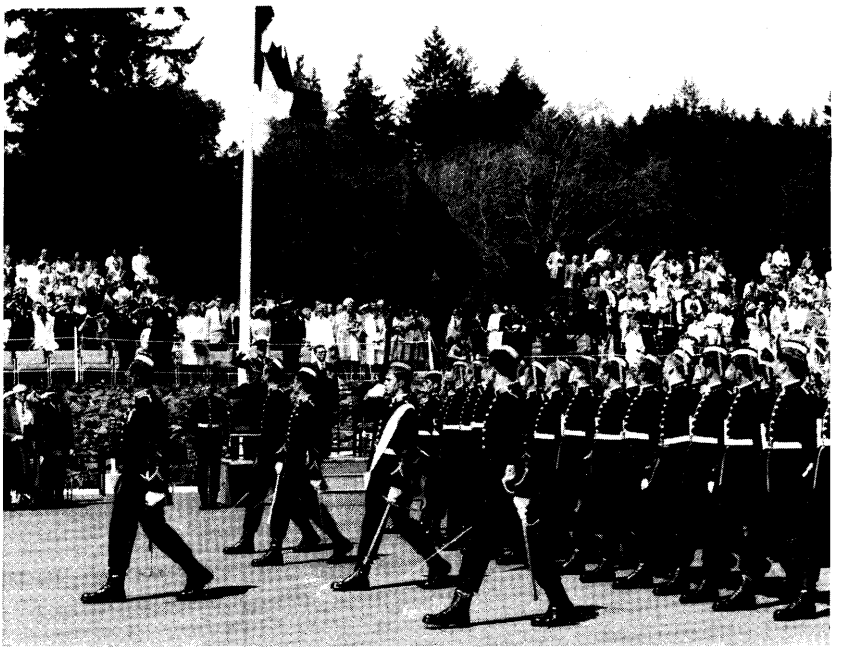
CATEGORIES OF STUDENTS

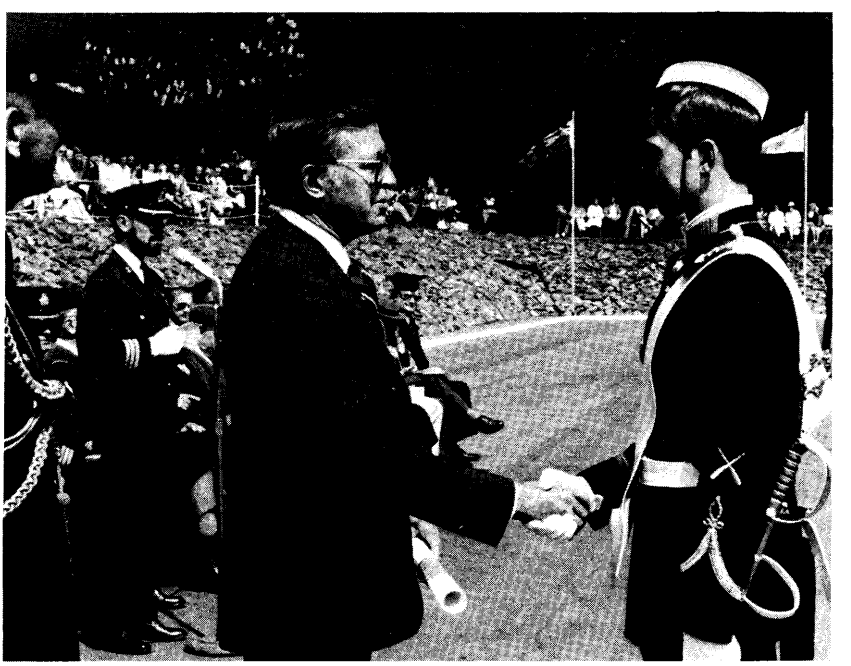
Three different categories of students may attend RRMC. These are:

a. Officer Cadets — Officer Cadets are admitted into the first year at RRMC under the Regular Officer Training Plan (ROTP), the Reserve Entry Training Plan



A UNIVERSITY DEGREE





AND A QUEEN'S COMMISSION

(RETP), or the University Training Plan — Men (UTPM), as full time students. Officer Cadets complete their first two years of training at RRMC and then proceed to RMC or CMR to complete the final two years of their degree program, unless pursuing a Bachelor of Arts or Bachelor of Science degree program at RRMC.

b. Officers — Students attending RRMC under the University Training Plan — Officers (UTPO).

c. Special Students — Other members of the Canadian Forces taking one or more courses at RRMC on a part-time basis.

THE REGULAR OFFICER TRAINING PLAN (ROTP)

The defence program at home and abroad has created a demand for a large number of officers to meet current and future needs. This is especially true in the technical fields. To meet the demands of this program, the ROTP was introduced in 1951.

The purpose of the ROTP is to provide the principal source of highly qualified officers for the Canadian Forces. The plan gives young Canadians the opportunity of gaining a university education and a permanent commission in the Canadian Forces.

Under this plan, applicants who have been accepted for entry at the Canadian Military Colleges enroll in the Regular component of the Canadian Forces. Some candidates may be offered ROTP support at a civilian university, provided they have been admitted to that university to a program of study that is eligible for ROTP support. On successful completion of their training, Officer Cadets will be promoted to commissioned rank in the Canadian Forces.

Successful applicants are enrolled on a career basis, for an initial nine-year period of service at Her Majesty's pleasure, and thus are assured of all benefits to Regular Force officers.

Under this plan, the costs of tuition, uniforms, books and instruments, and other essential fees for the duration of the program of studies are borne by the Department of National Defence. In addition, an Officer Cadet is paid a monthly salary from which there are deductions for income tax, pension plan, supplementary death benefit contributions, and for rations and quarters charges. Free medical and dental care is provided through the entire training period. Annual leave with full pay is granted according to regulations.

An Officer Cadet is obliged to maintain a satisfactory academic, military, and physical standard throughout his course. An Officer Cadet who fails a year at College may, on the recommendation of the College and the element concerned, be permitted to attend a repeat year at his own expense (see the section on Fees and Allowances) and, if successful, be reinstated to full pay and allowances.

An Officer Cadet who is enrolled under the ROTP may apply for release without obligation between 1 November and up to, but not including, the first day of the second academic year. Thereafter, an ROTP Officer Cadet who seeks release shall reimburse the Crown for all expenses incurred by reason of attendance at a Canadian Military College

or civilian university. If he is unable to pay the costs prior to release, he may sign a promissory note or he may elect to serve, as an Officer Cadet, a period appropriate to the indebtedness.

Regulations and procedures are established whereby Regular Officers may obtain release prior to reaching compulsory release age, unless a state of emergency exists. Former members of the ROTP are subject to the same arrangements, except that, in recognition of the subsidization that has been provided, release within four years of graduation will be considered only under special and unforseen circumstances. Release in such circumstances will be subject to reimbursement of all or part of the cost of subsidization.

The day after he has received his degree on graduation from the Royal Military College of Canada, Royal Roads Military College, or le Collège militaire royal de Saint-Jean, an Officer Cadet is promoted to commissioned rank in the Regular component of the Canadian Forces, provided that he has also obtained complete qualifications.

A pamphlet with more complete information on the ROTP may be obtained on application to the Registrar at one of the Canadian Military Colleges or to the Director of Recruiting and Selection, National Defence Headquarters, Ottawa, Ontario K1A 0K2, or to the Commanding Officer of any Canadian Forces Recruiting Centre.

THE RESERVE ENTRY TRAINING PLAN (RETP)

Since 1961, provision has been made to have up to 15 per cent of the annual ROTP intake at the Royal Military College of Canada, Royal Roads Military College, and le Collège militaire royal de Saint-Jean accepted as Reserve Entry cadets. Therefore, young men who wish to enter any of the Canadian Military Colleges, other than through the ROTP, may apply for admission as Reserve Entry cadets. Reserve Entry Officer Cadets receive the same education and training as ROTP Officer Cadets, but they are required to pay fees to defray the costs of tuition, clothing, books, instruments, laundry, dry cleaning, meals, and accommodation during the academic year, according to the scale of fees set out in the section on Fees and Allowances. Reserve Entry cadets may transfer to the ROTP at any time during their College course, in which event they would pay no further fees and would receive the same financial benefits as ROTP cadets. Reserve Entry cadets are committed to serve in a component of the active Reserve Forces upon graduation and commissioning. The admission requirements for Reserve Entry cadets are the same as those for cadets who enter under the ROTP.

The purpose of the RETP is to provide a limited number of vacancies at the Canadian Military Colleges for those young men who would like to have military training along with their education, but who are not prepared to commit themselves to a Service career at the time of entry. All Reserve Entry cadets are required to take summer training with the component of their choice, for which they receive pay and allowances.

The day after he has received his degree on graduation at one of the Canadian Military Colleges, a Reserve Entry Officer Cadet is promoted to commissioned rank in the Reserve component of the Canadian Forces, provided that he has obtained complete military qualifications.

A bulletin with more complete information on the RETP may be obtained on application to the Registrar at one of the Canadian Military Colleges, or to the Director of Recruiting and Selection, National Defence Headquarters, Ottawa, Ontario K1A 0K2, or the commanding officer of any Canadian Forces Recruiting Centre.

Attention is drawn to the Dominion Cadetships and to the Royal Military College Club of Canada Foundation Scholarships, which are found in the section of the calendar dealing with Cadetships and Scholarships.

THE UNIVERSITY TRAINING PLAN — MEN (UTPM)

Since 1973, provision has been made for serving members of the Canadian Forces who qualify for subsidization under the UTPM to take their degree programs at the Canadian Military Colleges. Approximately 10 UTPM candidates enter Royal Roads Military College each year under this scheme.

Training under the UTPM is limited to serving men and women of the Regular Force. A selected applicant undergoes academic training identical with that under the ROTP, but with a slightly modified military and athlétic program while at the college. The summer military training is identical with that of the ROTP. Except for certain differences in pay and terms of service, the policy and procedures for the UTPM are identical with those for the ROTP as prescribed in CFA09-12. The UTPM is therefore a modification of the ROTP and its purpose is the same: to train selected candidates to become career officers in the Regular Force. Like one's counterpart in the ROTP, an Officer Cadet in the UTPM will be selected to attend a Canadian Military College (CMC) or a university.

THE UNIVERSITY TRAINING PLAN — OFFICERS (UTPO)

The UTPO supplements other means of obtaining career officers with university degrees in the regular force. Servicing officers of the regular forces who have sufficient academic background to enable them to obtain a baccalaureate degree in two or less academic years, and who meet the other requirements as specified in CFAO 9-40, are eligible to apply for the UTPO.

Royal Roads currently offers BSc and BA degree programs of study. Science applicants should, as far as possible, have completed Math, Physics, and Chemistry courses equivalent to those listed in RRMC Calendar for the first two years of a Science or Engineering Degree Program. Arts applicants should have completed History and Political Science courses equivalent to those listed in RRMC Calendar for the first two years of an Arts Degree Program.

SUMMER TRAINING

The summer term, which must be taken by all Officer Cadets who successfully complete the academic terms, is spent in practical military training with the element in which they are enrolled. During the summer term, cadets will receive pay and allowances as prescribed. The summer training period is approximately nine weeks long.

CANADIAN FORCES COUNSELLING

The staffs of the three colleges include officers from the Canadian Forces who are responsible for career counselling and arrangements for military training programs for all

Officer Cadets of regular status. These officers are available to the cadets at all times to answer inquiries on military matters and to offer advice on military careers.

ACADEMIC COUNSELLING

At Royal Roads, senior members of the faculty serve as academic advisors to the cadets. These professors are available to the cadets at all times to counsel them in their academic progress, to guide them in their choice of programs of study, or to advise them on any non-military matters that the cadets may wish to discuss.

FEES AND ALLOWANCES

Regular Officer Training Plan

An Officer Cadet who is a member of the ROTP shall have his fees paid by the Department of National Defence and shall be entitled to receive pay, allowances, and transportation and travelling expenses as prescribed by the ROTP.

An Officer Cadet who is a member of the ROTP but who has failed a semester or year and is permitted to repeat that semester or year at his own expense shall be required to pay the amount prescribed in QR&Os. The current annual rates, which are subject to change, are:

a. $800.00 in respect of tuition, clothing, books, instruments, drawing materials, dry cleaning, and incidental expenses;
b. a fee of $2,003.28 each year to defray the costs of meals and accommodation; and
c. an annual Recreation Club Fee of $60.00.

Reserve Entry Training Plan

An Officer Cadet who is enrolled at the college under the RETP shall pay the following fees on the first day of arrival at RRMC, based on the current prevailing annual rates established by the Queen's Regulations and Orders:

a. annual college fee of $800.00, to defray the costs of tuition, clothing, books, instruments, drawing materials, dry cleaning, laundry, and incidental expenses;
b. a fee of $2,003.28 each year to defray the costs of meals and accommodation;
c. an Annual Recreation Club Fee of $60.00;
d. a book deposit of $100 (refunded at end of academic year).

An optional payment system may be exercised whereby payment may be made in two stages:

a. each year, $1,500 on or before the first day a cadet reports to the College, and the balance payable on or before 31 January of the same academic year.

NOTE — These are the current rates, and are subject to change.

University Training Plans — UTPM and UTPO

An Officer Cadet who is a member of the UTPM or an officer who is a member of the UTPO shall have his fees paid by the Department of National Defence and shall be

entitled to receive pay, allowances, and transportation and travelling expenses as prescribed by the applicable plan.

Mess Subscriptions

All Officer Cadets are required to pay a mess subscription, extra messing charges and charges levied for special functions at a rate prescribed by the Mess Constitution.

Transportation

An Officer Cadet of the Regular Forces proceeding to his home on leave, once in each year, for the portion of the journey to his home and return actually made in Canada or between Canadian points, is entitled to transportation allowances at Public expense, in accordance with QR&O.

Special Students

Special students taking a course or courses at RRMC will pay no fees but may be responsible for the purchase of their own textbooks and supplies.

CADETSHIPS AND SCHOLARSHIPS

Scholarships and Bursaries

Applicants under the Reserve Entry Training Plan may be eligible for a number of scholarships and bursaries available to students at Canadian Universities, including the Canada Student Loans Plan and also the Foundation Scholarships of the Royal Military College Club of Canada.

Canada Student Loan Plan

This plan, instituted by the Federal Government in 1964, was introduced to provide loans to supplement the resources of a student and/or the parents where in the absence of such aid, a student would be unable to pursue a post-secondary education. A student should apply for a loan under this plan for only the funds needed, over and above those from his own resources and/or those of his family, to enable him to continue his studies. The institution to which application is made will determine the amount of loan required in each case.

Borrowers under this plan are required to repay principal and to pay interest, but no payments are required so long as the student is in full-time attendance at an eligible institution and for six months thereafter. Interest charges during this period are paid by the Federal Government, which also guarantees the loan principal. After the interest-free period, repayment of principal and simple interest charges on the outstanding balance are required in regular monthly payments to the bank from the borrower. The maximum amount which may be advanced under this plan to one student is $1,800 in one year. The maximum total indebtedness under this plan is $5,000.

Application should be made in the first instance to the Registrar. When a loan is approved, the institution will issue a Certificate of Eligibility that authorizes the student to make arrangements for the loan with any branch of any chartered bank in Canada.

Officer Cadets receiving the full benefits of the Regular Officer Training Plan normally will not be considered eligible for Canada Student Loans.

Foundation Scholarships — Royal Military College Club of Canada

The R.M.C. Club of Canada sponsors a number of Foundation Scholarships annually. These scholarships are awarded to qualified Reserve Entry Training Plan candidates at any of the three Military Colleges.

The purpose of the scholarship is to attract outstanding candidates to the College who at the time of entry are not prepared to decide upon a Service career but who, nevertheless, are anxious to profit from the disciplined life and excellent educational facilities available at the Military Colleges. In the awarding of the scholarships, the principle of scholastic excellence will be observed, in keeping with the purpose of the scholarships. Each scholarship has a value of $800 per year until graduation providing the holder successfully completes each previous college year. It is the intention of the Club that a scholarship coupled with the service pay received during the summer, would enable a cadet to defray the major portion of the basic financial obligations associated with the Reserve Entry Training Plan.

Application forms and further information may be obtained from:

The Secretary-Treasurer
R.M.C. Club of Canada
Royal Military College of Canada
Kingston, Ontario
K7L 2W3

or from the representative of the Branch of the R.M.C. Club of Canada in your area.

Dominion Cadetships

a. A Dominion Cadetship may be granted by the Minister to a cadet who, being a member of the Reserve Force, enters the intial year at a college under the terms and conditions of this article.

b. The value of a Dominion Cadetship shall encompass:
   (1) the annual college fee for the first year;
   (2) the amounts prescribed in QR&O in respect of the cost of single quarters and rations, for the first and subsequent years; and
   (3) the annual Recreation Club fee for the first and subsequent years.

c. Not more than fifteen Dominion Cadetships may be granted in a college year.

d. A candidate, to be eligible for a Dominion Cadetship, must meet the enrolment and academic standards for admission and be the child of a person who was killed, has died or is severely incapacitated as a result of service in:
   (1) the Canadian Forces; or
   (2) the Canadian Merchant Marine, during hostilities.

e. Application for a Dominion Cadetship shall be made in writing, giving full particulars of the candidate's eligibility under para (d) of this article, and shall normally be forwarded by the first day of March to a Canadian Forces Recruiting Centre or Canadian Forces Recruiting Detachment.

f. The final board of selection shall submit to the Minister for approval a list of candidates recommended for Dominion Cadetships, in order of merit.

g. A Dominion Cadetship is forfeited on failure of an academic year.

MEDALS, AWARDS AND PRIZES

The following annual awards may be won by Officer Cadets who meet the requirements as specified:

Medals

The Governor General's Gold Medal, awarded to the Officer Cadet who obtains the highest academic standing in his or her fourth year.

The Lieutenant-Governor of British Columbia's Silver Medal, awarded to the Officer Cadet who obtains the highest academic standing in his or her third year.

The Governor General's Silver Medal, awarded to the Officer Cadet who obtains the highest academic standing in his or her second year.

The Governor General's Bronze Medal, awarded to the Officer Cadet who obtains the highest academic standing in his or her first year.

Awards

The Commandant's Cup, awarded to the outstanding second, third or fourth year Officer Cadet for athletic ability and sportsmanship.

The Director of Studies' Cup, awarded to the outstanding first year Officer Cadet for athletic ability and sportsmanship.

The Royal United Services Institute of Vancouver Island Award, presented to the Officer Cadet of the first year who is judged to be the best all-round Officer Cadet.

The RMC Ex-Cadet Club Award, presented to the Officer Cadet of the second year who has displayed the most improvement in all phases of his military training.

The Military Engineering Association Award, presented to the best second year engineering classification Officer Cadet.

The Royal Canadian Armoured Corp Award, presented to the best second year land operations classification Officer Cadet.

The Navy League of Canada Award, presented to the best second year sea operations classification Officer Cadet.

The RCAF Association Award, presented to the second year air operations Officer Cadet with the highest academic and military proficiency.

The H.E. Sellers Award, presented to the Officer Cadet chosen as the best all-round second year ROTP/RETP Cadet.

The RMC Ex-Cadet Club (Vancouver Island Branch) Award, presented to the best all-round second year UTPM/UTPW.

The LCol F.J. Picking Award, presented to the Officer Cadet judged to be the best all around third year cadet.

The D.W. Hone Award in Physics and Oceanography, presented by Professor Emeritus D.W. Hone, awarded to the Officer Cadet who achieves the highest standing in physics and oceanography courses in the third year science program.

The Clarence €. Cook Award in Physics, presented by Professor Emeritus C.C. Cook, awarded to the Officer Cadet who achieves the highest standing in physics courses in the fourth year science program.

The Naval Officers Association of Canada (Vancouver Island Branch) Award, presented to the best fourth year sea operations classification cadet.

The Claus Gorgichuk Memorial Award, presented by the Graduating Class of 1979, awarded to the cadet of the graduating class judged by his peers to best exemplify the college motto: Truth, Duty, Valour.

The Sword of Merit, presented by the Department of National Defence to the graduating UTPM Cadet who achieves the highest military and academic standing in fourth year.

The Sword of Honour, presented by the Department of National Defence to the best all-round ROTP/RETP Cadet of the graduating class.

Additional prizes may also be awarded.

Departmental Prizes

Academic book prizes are awarded annually to the Officer Cadet in each year who achieves highest standing in the disciplines of Mathematics, Science and/or Engineering, Chemistry, Physics, Chemical and Physical Oceanography, and the Humanities-Social Sciences.

In addition, special book prizes may be awarded for work of unusual merit, when such prizes are recommended by an academic department and approved by Faculty Council.

Certificates

First Class Honours certificates are awarded to Officer Cadets of the first, second, or third year who obtain an overall A average in their final examinations, with no failures. In addition, second class and pass certificates are awarded to second year Officer Cadets obtaining an overall B standing (with no failures), or C or D standing, respectively, in their final examinations. A degree certificate will be awarded to those meeting the requirements of the Bachelor of Science or Bachelor of Arts degree at the end of the fourth year.

A student who completes his final year with first class honours standing will have his degree script inscribed "With Distinction".

ADMISSION TO ROYAL ROADS MILITARY COLLEGE

APPLICATION FOR ADMISSION

Officer Cadets

Forms and information for ROTP and RETP applicants may be obtained from any of the following:

a. Commanding Officer of any Canadian Forces Recruiting Centre;
b. Director of Recruiting and Selection, National Defence Headquarters, Ottawa, Ontario, K1A 0K2;
c. Registrar, Royal Roads Military College, FMO Victoria, British Columbia, V0S 1B0;
d. Registrar, Royal Military College of Canada, Kingston, Ontario, K7L 2W3; or
e. Registrar, le Collège militaire royal de Saint-Jean, Québec, J0J 1R0.

Applications for admission should be made as early as possible in the year prior to entry. Applications are normally initiated through the Canadian Forces Recruiting Centre closest to the home of the applicant.

Application must be accompanied by a birth certificate and certificates of educational achievement, as specified in the instructions sent to all applicants.

Serving members interested in the UPTM should refer to CFAO 9-13.

Serving officers interested in the UTPO should refer to CFAO 9-40.

Special Students

Officers or men wishing to enrol as special students at RRMC must apply in writing to the Registrar, giving details of previous education and indicating the course or courses desired. All such candidates will be interviewed personally at the College regarding their course selection, at a time to be set by the Registrar; normally about three weeks before the start of classes each semester.

ADMISSION REQUIREMENTS

Applicants for admission to RRMC as Officer Cadets under the ROTP or RETP:

a. must be Canadian citizens;
b. must have reached their sixteenth, but not their twenty-first birthday by 1 January preceding entrance, with the exception of candidates for le Collège militaire royal de Saint-Jean, who must have reached their sixteenth, but not their twentieth birthday by 1 January preceding entrance;
c. must be single;
d. must meet the appropriate physical standards for the Canadian Forces; and
e. must possess the academic qualifications as set forth below.

NOTE — UTPM candidates should consult CFAOs.

ACADEMIC QUALIFICATIONS

General

All candidates should be aware that the course requirements at a Canadian Military College are considerably more diversified than at a civilian university, and include two years of Mathematics and Science at the university level for an Arts degree, and two years of English and other Arts courses for a Science or Engineering degree.

It should be noted that all programs of study at the Canadian Military Colleges are of four years' duration beyond the normal secondary school level required for university admission, except for candidates entering le Collège militaire royal de Saint-Jean, where a five-year course is required.

Science or Engineering

An applicant for admission to a Science or Engineering program at the Royal Roads Military College must have completed a matriculant year, at a level satisfactory to the College, with credits acceptable for admission to a Faculty of Engineering at a university in the province in which he has completed his secondary education. These levels at present are:

British Columbia	Grade XII
Alberta	Grade XII
Saskatchewan	Grade XII
Manitoba	Grade XII
Ontario	Grade XIII
Quebec	CEGEP 1, or equivalent
New Brunswick	Grade XII
Nova Scotia	Grade XII
Prince Edward Island	First year university, or equivalent
Newfoundland	First year university, or equivalent

Specific course requirements at this level include standing in the following subjects:

English or French
Mathematics
Physics
Chemistry

NOTE — In most provinces, one matriculant level course in Mathematics is required. In Alberta, Math 31 is required as well as Math 30. In Ontario, candidates require at least two of the following Mathematics courses: Algebra, Calculus or Functions and Relations. In Saskatchewan, both Algebra 30 and Geometry/Trigonometry 30 are preferred.

In New Brunswick, specific subjects offered for RRMC admission must be at the 121 or 122 level, with 121 level courses preferred.

Superior candidates may be admitted lacking English and one of Physics or Chemistry.

Arts

An applicant for admission to an Arts program at the Royal Roads Military College must have completed high school graduation at a level satisfactory to the College, with credits acceptable for admission to a university in the province in which he is completing his secondary education. These levels at present are:

British Columbia	Grade XII
Alberta	Grade XII
Saskatchewan	Grade XII
Manitoba	Grade XII
Ontario	Grade XIII
Quebec	CEGEP 1, or equivalent
New Brunswick	Grade XII
Nova Scotia	Grade XII
Prince Edward Island	First year university, or equivalent
Newfoundland	First year university, or equivalent

All candidates must have obtained credits, in the year *prior* to high school graduation, in the following subjects:

English
Mathematics
Physics and Chemistry (or a course in Science leading to final year high school courses in Physics or Chemistry)

Specific course requirements for admission to Arts at RRMC include high school graduation with credits in the following subjects:

English
Mathematics

NOTES — 1. The Mathematics requirement is that high school graduation course that is a prerequisite for the study of Calculus.

2. In Alberta, where two matriculant level courses are offered, Math 30 is required and Math 31 preferred. In Ontario, where three courses are offered, Functions and Relations or Calculus is required as a minimum. In Saskatchewan, Algebra 30 is required and Geometry/Trigonometry 30 preferred.

3. In New Brunswick, specific subjects offered for RRMC admission must be at the 121 or 122 level, with 121 level courses preferred.

Candidates for admission to the Royal Military College of Canada should consult the calendar of that college for full particulars of the admission requirements.

Candidates for admission to le Collège militaire royal de Saint-Jean should consult the calendar of that college for full particulars of the admission requirements and the syllabus for entrance examinations. Such candidates may enter preparatory year with Junior Matriculation (or equivalent) in the required subjects. Candidates who have a classical BA (Science-Mathematics option) may be admitted into first year at le Collège militaire royal de Saint-Jean.

PHYSICAL REQUIREMENTS

The fundamental medical requirement is a sound, healthy body with normal mental and muscular co-ordination. Any condition that, as it exists, or owing to possible progression, may limit the candidate's career as a member of the Canadian Forces shall be cause for rejection.

SELECTION OF CANDIDATES

Officer Cadets

Eligible applicants to the ROTP or RETP are required to appear at a Canadian Forces Recruiting Centre (CFRC) for a medical examination, testing, and interview, at a convenient time after the date of their application. They will be provided with return transportation and normal travelling expenses from their place of residence to the CFRC and with living expenses while at the CFRC.

Candidates will be advised shortly after their interview as to the status of their application.

The selection of Officer Cadets is made by the Final Board of Selection appointed by the Minister of National Defence. Candidates will be advised of the decision of the Final Board of Selection and shall subsequently be sent the necessary joining instructions.

Final selection is based on academic standing and on the recommendations of the Interview and Medical Boards as to the personal and physical suitability of the candidates.

Selection of applicants to the UTPM is made by military and academic boards convened at NDHQ each year.

Special Students

Special students will be selected by the RRMC Admissions Committee. Candidates will be selected not only on their academic potential, but also on the basis of the courses they have selected and the feasibility of these courses being offered in any given semester.

Special students may select courses with the approval of the Registrar, the Head of the Department concerned, and the Royal Roads Military College Faculty Council.

JOINING INSTRUCTIONS

As soon as the decision of the Final Board of Selection is made known, the Colleges send out Joining Instructions to each of the successful applicants. They shall be informed of the date of joining, the procedure to be followed, and the clothing and equipment they should bring with them, and they shall be given instructions about transportation and travelling allowances.

THE CURRICULUM

DEFINITIONS

Program of Study — A program of study is a group of courses in different subjects required for completion of a degree in a given area of concentration, eg. Mechanical Engineering, Honours Science (Mathematics and Physics), General English.

Subject — A subject is a division of the program of studies, eg. French, Economics, Physics.

Course — A course is a series of lectures, tutorials, and/or laboratory periods in a given subject. The different courses at Royal Roads Military College are designated by letter and number combinations. The designation system is explained on page titled Course Descriptions. Courses may extend over one semester (eg. Physics RR201), or over two semesters (eg. Mathematics RR 103).

Elective — An elective is a course selected by the student from several designated offerings to fulfill requirements of an approved program of study.

Units of Credit — The relative weight assigned to a course is defined in terms of units of credit. A full university-level course would normally be assigned a weighting of four units of credit per semester.

Semester Grade Average — The semester grade average is obtained by multiplying the final semester numerical grade in each course by the number of units of credit assigned to that course, summing the resultant products for each course in which a semester grade was reported, and dividing the sum by the total number of units of credit recorded.

CANADIAN MILITARY COLLEGE DEGREE PROGRAMS

Officer Cadets may begin their degree studies at any one of the three Canadian Military Colleges. Cadets taking the BSc degree program in Physics and Oceanography or in Physics and Computer Science may complete their final two years of studies at Royal Roads Military College. Cadets wishing the BA degree program in Military and Strategic Studies may complete their final two years of studies at RRMC. Cadets enrolled in other degree programs must complete their final two years of studies at Royal Military College or le Collège militaire royal de Saint-Jean.

The Canadian Military Colleges hold membership in the Association of Universities and Colleges of Canada. The degree programs are fully accredited. The engineering degree programs meet the standards laid down by the Association of Professional Engineers of the province of Ontario.

The Royal Roads Military College Academic Program

The academic year at Royal Roads Military College consists of two semesters, each of which consists of about 13 weeks of instruction and two weeks of final semester examinations.

In the first year at Royal Roads Military College, two programs of study are available to Officer Cadets, one of which leads to a degree of Bachelor of Arts or Bachelor of Administration, and the other to a degree of Bachelor of Science, Bachelor of Engineering, Bachelor of Arts, or Bachelor of Administration.

In the second year at Royal Roads Military College, programs of study are available to Officer Cadets leading to all of the various undergraduate degrees offered at all of the CMCs.

Royal Roads Military College offers, in the third and fourth years, a Bachelor of Science degree in Physics and Oceanography in either a "Combined Major" or "Honours" Program of Study; a Bachelor of Science degree in Physics and Computer Science in a "Combined Major" Program of Study as well as a Bachelor of Arts degree in Military and Strategic Studies. Science students may enter the "General Science" Program of Study at the end of any semester in third or fourth year with the permission of Faculty Council.

Royal Roads Military College offers the following degrees to those considered worthy of the honour:

a. Doctor of Law, *honoris causa*;
b. Doctor of Science, *honoris causa*; and
c. Doctor of Military Science, *honoris causa*.

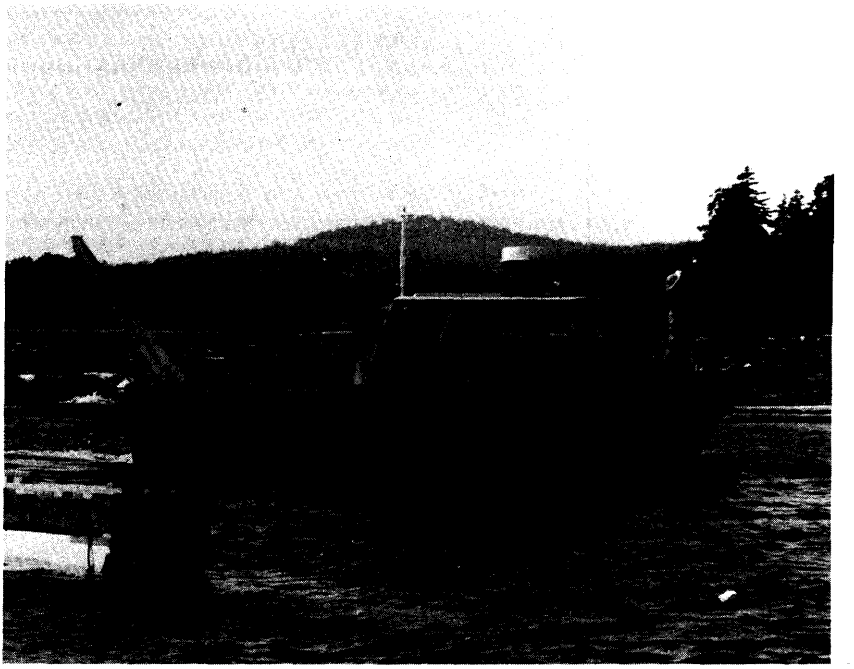
The above degrees are granted by the Royal Roads Military College under the authority of "The Royal Roads Military College Degrees Act", passed by the thirtieth Parliament of the British Columbia Legislative Assembly and given Royal Assent on 26 March 1976.

BACHELOR OF SCIENCE DEGREES — RRMC

The purpose of the RRMC Science degree programs is to produce general service officers who are capable of working in land, sea and air environments; who have a sound knowledge of basic physics, chemistry, mathematics and an appreciation of general engineering subjects and, who will appreciate those aspects of the social sciences and humanities relevant to the military profession and ethic. The programs fit students for military service in most classifications upon graduation, and are a suitable basis for further academic and military training.

BSc IN PHYSICS AND OCEANOGRAPHY — RRMC

The purpose of specialization in physics and physical oceanography is to learn how to apply physical laws and use the techniques of the exact sciences to solve problems. The interests of many operational and technical classifications are reflected in the emphasis and choice of topics studied. Attention is paid to the characteristics of the environments in which military forces operate, and the student studies the structure of the earth, the ocean bed, the air-sea interface including ice, the atmosphere and space, and especially the water column. Both chemical and biological oceanography are studied, but there is more



OCEANOGRAPHIC RESEARCH VESSEL

SEA MEASUREMENT

emphasis upon physical oceanography because it is more closely related to military problems.

Two levels of the BSc degree are offered in Physics and Oceanography. There is a "combined major" degree, and exceptional students may be awarded a "combined major degree with honours" upon completion of additional requirements. These programs provide a sound scientific background and specialization in a modern field.

Much of the material studied is common to all the CMC science degrees, eg. introductory and intermediate level courses in engineering, physics, and chemistry, with emphasis upon mathematics. The specific topics covered in courses during the last two years may be found in the body of the calendar in the section on Course Descriptions. In all three programs the mathematics courses emphasize analysis with particular attention to complex variables and differential equations, digital computing, and probability and statistics with applications to communications and theory. Physics courses include applications of mechanics, digital electronics, and electromagnetic wave propagation encountered in communications, navigation, surveillance and control systems.

The course on geophysical oceanography deals particularly with the sea bed, as well as with the rest of the earth's structure. The course on aeronomy examines air-sea-ice problems, dynamics of the atmosphere and ionosphere, and problems of remote sensing. In addition to courses in general chemistry and physical chemistry the Chemistry Department offers introductory courses in analytical chemistry and in chemical and biological oceanography in the third year and a course in applied thermodynamics in the fourth year. The important subject area of physical oceanography is covered by courses in descriptive and dynamic oceanography which are broadened by field work. Following first and second year courses in engineering graphics and mechanics of materials the Engineering Department gives a course on fluid dynamics which is an option for the general program. In addition, students taking the combined major or honours also study acoustics, atomic physics, nuclear physics, and advanced dynamic oceanography.

Laboratory experiments are augmented by visits to west coast research ships and institutions, and by projects which involve making standard oceanographic measurements from the College research launch. Seminars and research projects bring the student up to date in selected areas.

BSc IN PHYSICS AND COMPUTER SCIENCE — RRMC

The purpose of specialization in Physics and Computer Science is to learn how to apply physical laws and to solve problems using or involving computers. A useful, well established and relatively stable background is provided in the natural sciences, with the greatest specialization in physics. As well, an entry is made into the volatile and rapidly developing discipline of computer science. Knowledge of natural science will remain relevant and useful, but some knowledge of computer technology will become obsolete in a few years. The purpose, therefore, is to provide a useful knowledge of current technology, particularly those parts of interest to the military, but also sufficient theoretical background to enable the student to keep up with developments in this growing field.

The physics part of the program is the same as that in the "Combined Major" in Physics and Oceanography. The computer science curriculum is based upon the core curricula recommended by Committees of the Association of Computing Machinery (ACM) and the Institute of Electrical and Electronic Engineers (IEEE). The IEEE part of the curriculum places a greater emphasis upon militarily relevant hardware than does that of the ACM.

Course descriptions will be found under the Engineering, Mathematics and Physics Departments. No honours level will be introduced during 1982-83.

BSc IN GENERAL SCIENCE — RRMC

The BSc program in General Science is normally entered from one of the other science programs. It has the same purpose as the others, and therefore a core of Engineering, Mathematics and Physics courses is normally required. All the courses are exactly the same as those of the other programs, but the choice of electives is more flexible and fewer credits are required for the degree.

Course descriptions are found in the appropriate departmental section of the Calendar, and the requirements of the program of study are shown with the Tables of the other programs.

RRMC BSc DEGREES ADMISSIONS REQUIREMENTS

General Degree in Science

Satisfactory completion of second year in any CMC science or engineering program of study which includes a course in chemistry.

Combined Major in Physics and Oceanography

Completion of second year in a CMC science or engineering program of study which includes a course in chemistry and Mathematics RR241 and Engineering RR232, or their equivalents. A weighted grade average in mathematics, science, or engineering subjects of at least D+ is required.

Combined Major in Physics and Computer Science

Completion of second year in a CMC science or engineering program of study which includes a course in chemistry and Mathematics RR241 and Mathematics RR252 or their equivalents. A weighted average of at least D+ is required in mathematics, science and engineering courses.

Honours Degree in Physics and Oceanography

Completion of third year in the combined major program in Physics and Oceanography with a weighted average in courses in mathematics, science, and engineering of at least B+. Students who have achieved less than second class honours may be admitted to the Honours program on a probationary basis with Faculty Council approval.

Third year enrolment will be limited in numbers. Preference will be given to Officer Cadets in accordance with their overall academic and military performance.

BA IN MILITARY AND STRATEGIC STUDIES — RRMC

The RRMC Military and Strategic Studies program is designed to introduce Officer Cadets to military history, strategic thought, international relations, and Canadian economic and political issues. It builds upon and develops from the first and second year programs of study at the CMCs. The program is intended as a solid foundation for subsequent officer development through individual study and disciplines relating to war and the military.

In order to familiarize students with research problems and critical analysis, and to enhance their ability in public speaking, class seminars and thesis requirements are mandatory in the fourth year of the Honours program. Students in the Honours program will be required to undertake an honours thesis extending over two semesters. They will discuss their research work in a seminar during the first term, and defend their findings in an oral exam by the end of the second term.

RRMC BA DEGREES ADMISSION REQUIREMENTS

General and Honours Degree in Military and Strategic Studies

Satisfactory completion of any CMC second year course of studies - arts, administration, science or engineering.

The Royal Military College Academic Program

The Royal Military College of Canada offers the following degree programs to Officer Cadets:

a. Bachelor of Arts (Honours) with specialization in —
   English
   History
   International Studies
   Political and Economic Science
   Economics and Commerce
   Military and Strategic Studies

b. Bachelor of Arts (General) with specialization in —
   English
   History
   Commerce
   Politics
   Economics
   Military and Strategic Studies

c. Bachelor of Science (Honours) with specialization in —
   Mathematics and Physics

d. Bachelor of Science with specialization in —
   Mathematics and Physics
   Science (Applied)

e. Bachelor of Engineering with specialization in —
Computer Engineering
Fuels and Materials Engineering
Electrical Engineering
Civil Engineering
Mechanical Engineering
Engineering Physics
Engineering and Management

The Royal Military College of Canada offers the following degree programs to commissioned officers in the Canadian Forces:

a. Master of Arts;
b. Master of Science; and
c. Master of Engineering.

The Royal Military College of Canada offers the following degrees to those considered worthy of the honour:

a. Doctor of Laws, *honoris causa*;
b. Doctor of Science, *honoris causa*; and
c. Doctor of Military Science, *honoris causa*.

The above degrees are granted by the Royal Military College of Canada under the authority of "The Royal Military College of Canada Degrees Act, 1959" passed by the twenty-fifth Ontario Legislature and given Royal Assent on 26 March 1959.

Le Collège Militaire Royal de Saint-Jean
Academic Program

Le Collège militaire royal de Saint-Jean offers the following degree programs:

a. Bachelor of Administration;
b. Bachelor of Science — General;
c. Bachelor of Science with a major in Physics and a minor in Mathematics;
d. Bachelor of Science with Honours in Physics;
e. Bachelor of Science in Computer Science
f. Bachelor of Arts in Canadian Studies and Administration;
g. Bachelor of Arts in Military and Strategic Studies; and
h. Bachelor of Arts with Honours in Military and Strategic Studies.

Cadets graduating from CMC are awarded the appropriate degree by the University of Sherbrooke.

SELECTION OF PROGRAM STUDY

Officer Cadets at Royal Roads Military College shall select a program of study that is compatible with their own interests and ambitions, the requirements of their element of the Canadian Forces, and the relevant academic regulations. The Canadian Forces reserves the right to limit enrolment in any given program of studies, or to select the location at which a program of studies will be taken. Each cadet will be assigned an Academic Adviser who can advise him on the academic requirements for the various programs of study. The programs of study which are acceptable to the different Military Officer Classifications are listed in Table 1.

TABLE 1

Military Classifications and Course Patterns Available to Members of the Regular Officer Training Plan

CLASSIFICATIONS

COURSE PATTERNS

Legend: 1 — Preferred 2 — Desirable 3 — Acceptable 4 — Unacceptable 5 — Unacceptable Note: refer to CFAO 9-12 for further clarification. * — Offered at CMCs	ENGINEERING											SCIENCE							ARTS										MISC	
MOC CLASSIFICATION	Aerospace	Civil*	Computer*	Electrical*	Fuels and Materials	Management*	Mechanical*	Nuclear	Physics*	Systems	Applied*	Chemistry	Computer*	General*	Geology	Math and Physics	Physics*	Physics and Oceanography	Canadian Studies	Economics*	English*	French	General	Geography	History*	Mathematics*	Military & Strategic Studies	Political Science	Administration*	Commerce*
21 Armour	3	2	2	2	2	2	1	3	2	2	2	3	2	2	2	2	2	3	2	2	2	2	2	2	2	2	1	2	2	2
22 Artillery	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
23 Infantry	3	3	3	2	3	3	2	3	3	2	2	3	3	2	3	2	2	2	2	3	2	3	3	2	2	2	2	2	2	3
31 Air Navigator	1	3	2	2	3	2	2	2	1	1	2	3	1	2	2	1	1	3	3	2	3	3	2	3	3	1	2	2	3	3
32 Pilot	2	3	2	2	3	2	2	3	2	2	2	3	2	2	3	2	2	3	3	2	3	3	3	3	3	2	2	2	3	3
33 Air Traffic Controller	2	3	1	2	3	2	2	3	2	1	2	3	1	2	3	2	2	3	3	3	1	1	3	3	2	2	2	3	2	3
64 Air Weapons Controller	2	3	1	2	3	2	4	3	2	2	2	3	1	2	3	2	2	3	3	2	3	3	3	3	3	2	2	2	3	3
71 Maritime Surface & Sub Surface	3	3	2	2	3	2	2	3	2	2	2	3	2	3	3	2	2	2	3	3	3	3	3	3	3	3	2	3	3	3
44 Maritime Engineer	3	3	3	1	3	3	1	3	2	2	3	4	3	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4
41 Aerospace Engineer	2	4	3	1	3	4	2	5	2	3	4	5	3	5	5	3	3	4	5	5	5	5	5	5	5	5	5	5	5	5
42 Comm & Electronic Engineer	2	4	1	1	4	3	3	3	1	2	2	4	1	3	4	2	2	4	5	5	5	5	5	5	5	4	4	5	5	5
43 Land Ordnance Engineer	4	4	3	1	3	2	1	3	2	2	3	4	3	4	4	3	3	4	5	5	5	5	5	5	5	5	5	5	5	5
45 Military Engineer	5	1	5	2	3	2	3	3	3	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

TABLE 1: CONT'D

Commerce*		1	3	1
Administration*		1	2	1
Political Science*		3	2	2
Military & Strategic Studies*		2	2	2
Mathematics*		3	3	3
History*		3	2	3
Geography		3	3	3
General		3	3	3
French		5	2	3
English*		5	2	3
Economics*		1	3	2
Canadian Studies*		2	3	2
Physics and Oceanography*		5	3	3
Physics*		5	2	3
Math and Physics*		5	2	3
Geology		5	3	3
General*		4	3	3
Computer*		2	2	2
Chemistry		5	3	3
Applied*		5	2	3
Systems		4	2	3
Physics*		5	2	3
Nuclear		5	3	3
Mechanical*		5	3	3
Management*		3	3	3
Fuels and Materials*		4	3	3
Electrical*		5	2	3
Computer*		3	2	3
Civil*		5	3	3
Aerospace		5	3	3
69 Logistics				
81 Security				
68 Personnel Administration				

RRMC PROGRAM OUTLINES

Tables 2 to 14 outline the programs of study available at Royal Roads Military College.

Corresponding course descriptions can be found on pages 133 to 169.

TABLE 2

First Year — Degrees in Arts or Administration

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
English RR113	English Literature 1100 to 1700; 1700 to 1950	3	0	0	4	3	0	0	4	
English RR123	Logic, Linguistics and Composition	2	0	0	2	2	0	0	2	
Language Training I	Conversational French	0	3	2	(3)	0	3	2	(3)	1, 3
Language Training IA	Conversational French	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 2
History RR113	Modern European History, 800 to 1950	3	0	0	4	3	0	0	4	5
Political Science RR102	Introduction to Political Science	—	—	—	—	3	0	0	4	
MLM RR111	Individual Psychology	3	0	0	4	—	—	—	—	
MLM RR212	Social Psychology	—	—	—	—	(3)	(0)	(0)	(4)	4
Mathematics RR103	Calculus and Analytical Geom; Introduction to Modern Algebra	3	2	0	4	3	2	0	4	
Elective		—	—	—	—	(3)	(0)	(0)	(4)	6
Computer Science RR102	Introduction to Computer Programming	—	—	—	—	1	0	1	2	
Chemistry RR123	Introductory Chemistry	3	0	3	4	3	0	3	4	
PE RR103		0	0	2	0	0	0	2	0	
Drill RR103		0	0	1	0	0	0	1	0	
Total		17	5	8	22	18	5	9	24	

NOTES — 1. Final grade based on year's work; no end-of-semester finals.
2. Taken in lieu of Language Training I by cadets who are functionally bilingual.
3. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of academic credit will be granted.
4. Required by those cadets who transfer from Science/Engineering to Arts at the end of the first semester.
5. Deferred to second year for cadets transferring to Arts from Science/Engineering at the end of the first semester.
6. With the permission of Faculty Council.

TABLE 3

First Year — Degrees in Science or Engineering

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
English RR103	Introduction to Logic, Grammar, and Composition, Utopian Literature	3	1	0	4	3	1	0	4	
English RR003	Composition, Logic and Author Study, Utopian Literature	(3)	(1)	(0)	(3)	(3)	(1)	(0)	(3)	4
Language Training I	Conversational French	0	3	2	(3)	0	3	2	(3)	1, 3
Language Training IA	Conversational French	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 2
MLM RR111	Individual Psychology	3	0	0	4	—	—	—	—	
Mathematics RR113	Calculus and Linear Algebra	5	3	0	5	5	2	0	5	
Computer Science RR122	Introduction to Computer Programming	—	—	—	—	2	0	2	4	
Physics RR101	Mechanics	4	1	3	5	—	—	—	—	
Physics RR112	Electricity and Magnetism	—	—	—	—	4	1	3	5	
Chemistry RR103	General Chemistry; Qual Anal; Introduction to Org. Chem.	3	0	3	4	3	0	3	4	
PE RR103		0	0	2	0	0	0	2	0	
Drill RR103		0	0	1	0	0	0	1	0	
Total		18	8	11	22	17	7	13	22	

NOTES — 1. Final grade based on year's work; no end-of-semester examination.
2. Taken in lieu of Language Training I by cadets who are functionally bilingual.
3. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of academic credit will be granted.
4. Taken in lieu of Eng 103 by cadets who require extra grammar and composition instruction.

TABLE 4A

Second Year — Degrees in Arts or Administration
(Students who have completed first year in Arts/Administration — TABLE 2)

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
English RR211	Major Twentieth Century Authors	(3)	(0)	(0)	(4)	(—)	(—)	(—)	(—)	9
English RR213	English Literature from Blake and Gibbon to 1950	3	0	0	4	3	0	0	4	
English RR222	Canadian Literature	(—)	(—)	(—)	(—)	(3)	(0)	(0)	(4)	9
Language Trg II	Conversational French	0	3	2	(3)	0	3	2	(3)	4, 7
Language Trg IIA	Conversational French	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	4, 5
History RR113	Modern European History 800 to 1950	(3)	(0)	(0)	(4)	(3)	(0)	(0)	(4)	1
History RR213	History of Canada	3	0	0	4	3	0	0	4	
Economics RR213	Principles of Economics	3	0	0	4	3	0	0	4	
Commerce RR203	Accounting	(3)	(0)	(0)	(4)	(3)	(0)	(0)	(4)	3, 8
Political Science RR102	Introduction to Political Science	—	—	—	—	(3)	(0)	(0)	(4)	1
Political Science RR213	International Politics	3	0	0	4	3	0	0	4	8
MLM RR111	Individual Psychology	(3)	(0)	(0)	(4)	—	—	—	—	1
MLM RR212	Social Psychology	—	—	—	—	3	0	0	4	2
Mathematics RR203	Calculus, Linear Algebra; Probability and Statistics; Operations Research	3	2	0	4	3	2	0	4	
Computer Science RR102	Introduction to Computer Programming	—	—	—	—	(1)	(0)	(1)	(2)	1
Physics RR123	Physical Science — Physics	3	0	3	4	3	0	1½	(4)	
Elective		(3)	(0)	(0)	(4)	—	—	—	—	
Elective		—	—	—	—	(3)	(0)	(0)	(4)	
PE RR203		0	0	2	0	0	0	2	0	
Drill RR203		0	0	1	0	0	0	1	0	
Total		18	5	8	24	21	5	6½	24	6

TABLE 4A CONT'D.

NOTES —
1. Required if not completed in first year.
2. Not required if completed in first year.
3. Required for entry to BAdm degree program (CMR).
4. Final grade based on year's work; no end-of-semester examinations.
5. Taken in lieu of Language Training II by cadets who are functionally bilingual.
6. Semester course loadings of less than 20 or more than 24 units of credit require the prior approval of Faculty Council.
7. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of academic credit will be granted.
8. Cadets intending to proceed to CMR in the BA Admin program may substitute Commerce RR203 for Political Science RR213.
9. Not offered in 1982/83.

TABLE 4B

Second Year — Degrees in Arts or Administration
(Students who have completed first year in Science/Engineering — TABLE 3)

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
English RR211	Major Twentieth Century Authors	(3)	(0)	(0)	(4)	(—)	(—)	(—)	(—)	9
English RR213	English Literature from Blake and Gibbon to 1950	3	0	0	4	3	0	0	4	
English RR222	Canadian Literature	(—)	(—)	(—)	(—)	(3)	(0)	(0)	(4)	9
Language Trg II	Conversational French	0	3	2	(3)	0	3	2	(3)	6, 8
Language Trg IIA	Conversational French	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	6, 7
History RR113	Modern European History 800 to 1950	(3)	(0)	(0)	(4)	(3)	(0)	(0)	(4)	1
History RR213	History of Canada	3)	0	0	4	3	0	0	4	
Economics RR213	Principles of Economics	3	0	0	4	3	0	0	4	
Commerce RR203	Accounting	(3)	(0)	(0)	(4)	(3)	(0)	(0)	(4)	2, 10
Political Science RR102	Introduction to Political Science	—	—	—	—	(3)	(0)	(0)	(4)	1
Political Science RR213	International Politics	3	0	0	4	3	0	0	4	10
MLM RR111	Individual Psychology	(3)	(0)	(0)	(4)	—	—	—	—	1
MLM RR212	Social Psychology	—	—	—	—	3	0	0	4	
Mathematics RR203	Calculus, Linear Algebra; Probability and Statistics; Operations Research	3	2	0	4	3	2	0	4	
Computer Science RR102	Introduction to Computer Programming	—	—	—	—	(1)	(0)	(1)	(2)	1
Physics RR123	Physical Science — Physics	3	0	3	4	3	0	1½	(4)	3
Elective		(3)	(0)	(0)	(4)	—	—	—	—	
Elective		—	—	—	—	(3)	(0)	(0)	(4)	
PE RR203		0	0	2	0	0	0	2	0	
Drill RR203		0	0	1	0	0	0	1	0	
Total		18	5	8	24	21	5	6½	24	5

TABLE 4B CONT'D.

NOTES —

1. Required if not completed in first year.
2. Required for entry to BAdm degree program (CMR).
3. PH 123 not required for cadets successfully completing PH 101 in their first year.
4. Second semester of HI 113 (ie. HI112) not required of cadets completing their first year in Sci/Eng but may be taken as an elective.
5. Semester course loadings of less than 20 or more than 24 units of credit require the prior approval of Faculty Council.
6. Final grade based on year's work; no end-of-semester examinations.
7. Taken in lieu of Language Training II by cadets who are functionally bilingual.
8. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of academic credit will be granted.
9. Not offered in 1982/83.
10. Cadets intending to proceed to CMR in the BAdm program may substitute Commerce RR203 for Political Science RR213.

TABLE 5

Second Year — General Degrees in Science

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
Language Training II	Conversational French	0	3	2	(3)	0	3	2	(3)	1, 6
Language Training IIA	Conversational French	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 5
History RR202	Modern Europe	—	—	—	—	3	0	0	4	
Economics RR201	Introduction to Economics	3	0	0	4	—	—	—	—	
Elective		(3)	(0)	(0)	(4)	—	—	—	—	3
Elective		—	—	—	—	(3)	(0)	(0)	(4)	3
MLM RR212	Social Psychology	—	—	—	—	3	0	0	4	
Mathematics RR223	Calculus, Vector Calculus, Differential Equations	3	1	0	3	3	1	0	3	
Mathematics RR241	Probability and Statistics	(2)	(1)	(0)	(2)	—	—	—	—	4, 7
Mathematics RR252	Linear Algebra; Elements of Operations Research	—	—	—	—	(2)	(1)	(0)	(2)	2
Physics RR201	Electricity	4	1	3	5	—	—	—	—	
Physics RR212	Modern Physics	—	—	—	—	4	1	3	5	
Chemistry RR212	Engineering and Physical Chemistry	—	—	—	—	4	1	3	5	
Computer Science RR201	Computer Applications	2	0	2	3	—	—	—	—	
Engineering RR261	Engineering Graphics	2	0	1	2	—	—	—	—	
Engineering RR232	Mechanics of Materials	—	—	—	—	(3)	(0)	(2)	(4)	3, 7
PE RR203		0	0	2	0	0	0	2	0	
Drill RR203		0	0	1	0	0	0	1	0	
Total		14	5	11	17	17	6	11	21	

TABLE 5 CONT'D.

NOTES —
1. Final grade based on year's work; no end-of-semester examinations.
2. Not required for Science (Applied) degree at RMC or General Science degree at CMR, but recommended. Required for other Science degree programs at RMC or CMR. Pass will give credit for MAT 212 at CMR.
3. With the permission of Faculty Council.
4. Optional but recommended. Pass = credit for Mathematics 327A at RMC, and for MAT 251 at CMR.
5. Taken in lieu of Language Training II by cadets who are functionally bilingual.
6. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of academic credit will be granted.
7. Recommended for students wishing to continue in the Physics and Oceanography program in third year.

TABLE 6

Second Year — Engineering/Honours Science/Engineering Physics Degree

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
Language Training II	Conversational French	0	3	2	(3)	0	3	2	(3)	1, 3
Language Training IIA	Conversational French	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 2
History RR202	Modern Europe	—	—	—	—	3	0	0	4	
Economics RR201	Introduction to Economics	3	0	0	4	—	—	—	—	
MLM RR212	Social Psychology	—	—	—	—	3	0	0	4	
Mathematics RR223	Calculus; Vector Calculus, Differential Equations	3	1	0	3	3	1	0	3	
Mathematics RR241	Probability and Statistics	2	1	0	2	—	—	—	—	
Mathematics RR252	Linear Algebra, Elements of Operations Research	—	—	—	—	2	1	0	2	
Mathematics RR233	Calculus; Vector Calculus; Differential Equations	(4)	(1)	(0)	(4)	(4)	(1)	(0)	(4)	4
Mathematics RR261	Probability and Statistics	(2)	(1)	(0)	(2)	—	—	—	—	4
Mathematics RR272	Linear Algebra; Elements of Operations Research	—	—	—	—	(2)	(1)	(0)	(2)	4
Physics RR201	Electricity	4	1	3	5	—	—	—	—	
Physics RR212	Modern Physics	—	—	—	—	4	1	3	5	
Chemistry RR201	Engineering Chemistry	4	1	0	4	—	—	—	—	
Chemistry RR242	Engineering Chemistry Laboratory	—	—	—	—	(0)	(0)	(3)	(1)	5
Computer Science RR201	Computer Applications	2	0	2	3	—	—	—	—	
Engineering RR263	Engineering Graphics and Descriptive Geometry	2	0	1	2	3	0	1	4	6
Engineering RR232	Mechanics of Materials	—	—	—	—	3	0	2	4	
PE RR203		0	0	2	0	0	0	2	0	
Drill RR203		0	0	1	0	0	0	1	0	
Total		20	7	11	23	21	6	11	26	

TABLE 6 CONT'D.

NOTES — 1. Final grade based on year's work; no end-of-semester examinations.
2. Taken in lieu of Language Training II by cadets who are functionally bilingual.
3. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of academic credit will be granted.
4. Not required but recommended for those who plan to continue in Electrical Engineering, Engineering Physics and Honours Science.
5. Required of those in Honours Science.
6. Second semester of EG 263 not required of cadets in the Honours Science program. A final grade in EG 261 will be given.

TABLE 7

Third Year — General and Honours Degree in Military and Strategic Studies

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
Language Trg III	Second Language Training	0	3	2	(3)	0	3	2	(3)	1, 2
Language Trg IIIA	Second Language Training	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1,3
MLM RR311	Principles of Administration and Supervision	3	0	0	4	—	—	—	—	
Political Science RR213	International Politics	3	0	0	4	3	0	0	4	
Political Science RR302	Crisis and War	—	—	—	—	3	0	0	4	7
Political Science RR321	Irregular Warfare	(3)	(0)	(0)	(4)	—	—	—	—	8
Political Science RR332	Arms Control	—	—	—	—	(3)	(0)	(0)	(4)	8
Political Science RR343	Modern Strategic Thought 1815-1980	3	0	0	4	3	0	0	4	4
Political Science RR441	Canadian Foreign Policy	3	0	0	4	—	—	—	—	7
History RR302	Technology and War, 1914 to present	—	—	—	—	3	0	0	4	
History RR343	Military in the Modern World 1789 to present	3	0	0	4	3	0	0	4	
Elective		(3)	(0)	(0)	(4)	(3)	(0)	(0)	(4)	5, 6
PE RR303		0	0	2	0	0	0	2	0	
Drill RR303		0	0	1	0	0	0	1	0	
Total		15	3	5	20	15	3	5	20	6

NOTES — 1. Grade based on year's work with no final examination.
2. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of academic credit will be granted to a maximum of nine in the full degree program.
3. Taken in lieu of Second Language Training III by cadets who are functionally bilingual.
4. If Political Science RR213, or its equivalent, was not completed in second year, it must be taken in third year.
5. Electives may be selected from any 300 or 400 level Arts or Science course if timetabling permits.
6. Semester course loadings of less than 20 or more than 24 units of credit require the prior approval of Faculty Council.
7. Offered in alternate years commencing 1982-83.
8. Offered in alternate years commencing 1983-84.

TABLE 8
Third Year — General Degree in Science

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
Language Trg III	Second Language Training	0	3	2	(3)	0	3	2	(3)	1, 3
Language Trg IIIA	Second Language Training	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 2
MLM RR311	Principles of Administration and Supervision	3	0	0	4	—	—	—	—	
Elective		3	0	0	4	—	—	—	—	
Elective		—	—	—	—	(3)	(0)	(0)	(4)	
Mathematics RR301	Differential Equations	3	0	0	4	—	—	—	—	
Computer Science RR312	Numerical Analysis	—	—	—	—	3	0	0	4	
Physics RR332	E-M Wave Propagation	—	—	—	—	3	0	3	4	
Physics RR352	Intermediate Mechanics	—	—	—	—	3	0	0	4	
Physics RR371	Electronics and Microcomputers	3	0	3	4	—	—	—	—	
Chemistry RR301	Quantitative Analysis	2	0	4	4	—	—	—	—	4
Oceanography RR301	Descriptive Oceanography	3	0	0	4	—	—	—	—	4
Oceanography RR322	Biological Oceanography	—	—	—	—	2	0	1	3	5
Oceanography RR332	Chemical Oceanography	—	—	—	—	3	0	2	4	5
Oceanography RR341	Practical Oceanography	—	—	3	1	—	—	—	—	4
Computer Science RR301	Introduction to Computer Systems	4	0	2	5	—	—	—	—	4
Computer Science RR322	Microcomputer Systems	—	—	—	—	2	0	4	4	5
Computer Science RR332	Organization of Programming Language	—	—	—	—	3	0	1	4	5
PE RR303		0	0	2	0	0	0	2	0	
Drill RR303		0	0	1	0	0	0	1	0	
Total										6

NOTES — 1. Final grade based on year's work; no end-of-semester examinations.
2. Taken in lieu of Language Training III by cadets who are functionally bilingual.
3. For each fifteen lessons of Dialogue Canada satisfactorily completed, three units of academic credit will be granted.
4. Two courses to be selected in the first semester.
5. Two courses to be selected in the second semester.
6. A minimum of 36 units of Science credits and 4 units of Arts credit must be achieved during the year.

TABLE 9

Third Year — Combined Major in Physics and Computer Science

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
Language Trg III	Second Language Training	0	3	2	(3)	0	3	2	(3)	1, 2
Language Trg IIIA	Second Language Training	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 3
MLM RR311	Principles of Administration and Supervision	3	0	0	4	—	—	—	—	
Arts Elective		—	—	—	—	3	0	0	4	4
Mathematics RR301	Differential Equations	3	0	0	4	—	—	—	—	
Physics RR332	Electromagnetic Wave Propagation	—	—	—	—	3	0	3	4	
Physics RR352	Intermediate Mechanics	—	—	—	—	3	0	0	4	
Physics RR361	Acoustics	2	0	0	3	—	—	—	—	
Physics RR371	Electronics and Microcomputers	3	0	3	4	—	—	—	—	
Computer Science RR301	Introduction to Computer Systems	4	0	2	5	—	—	—	—	
Computer Science RR312	Numerical Analysis	—	—	—	—	3	0	0	4	
Computer Science RR322	Microcomputer Systems	—	—	—	—	2	0	4	4	
Computer Science RR332	Organization of Programming Language	—	—	—	—	3	0	1	4	
Science Elective		3	0	0	4	—	—	—	—	5
Science Elective		—	—	—	—	3	0	0	4	5
PE RR303		0	0	2	0	0	0	2	0	
Drill RR303		0	0	1	0	0	0	1	0	
Total		18	3	10	24	20	3	13	28	

NOTES — 1. Grade based on year's work with no final examination.
2. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of credit will be granted to a maximum of nine in the full degree program.
3. Taken in lieu of Second Language Training III by cadets who are functionally bilingual.
4. Electives are Political Science RR102, French RR212, or any 300 or 300 level course offered in Economics, English, French, History, Philosophy, or Political Science.
5. Two science electives must be taken totalling at least 7 units of credit.

TABLE 10

Third Year — Combined Major in Physics and Physical Oceanography

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
Language Training III	Second Language Trg.	0	3	2	(3)	0	3	2	(3)	1, 2
Language Training IIIA	Second Language Trg.	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 3
MLM RR311	Principles of Administration and Supervision	3	0	0	4	—	—	—	—	
Elective		—	—	—	—	3	0	0	4	4, 5
Mathematics RR301	Differential Equations	3	0	0	4	—	—	—	—	
Computer Science RR312	Numerical Analysis	—	—	—	—	3	0	0	4	
Physics RR332	E-M Wave Propagation	—	—	—	—	3	0	3	4	
Physics RR352	Intermediate Mechanics	—	—	—	—	3	0	0	4	
Physics RR361	Acoustics	2	0	0	3	—	—	—	—	
Physics RR371	Electronics and Microcomputers	3	0	3	4	—	—	—	—	
Chemistry RR301	Quantitative Analysis	2	0	4	4	—	—	—	—	
Oceanography RR301	Descriptive Oceanography	3	0	0	4	—	—	—	—	
Oceanography RR322	Biological Oceanography	—	—	—	—	2	0	1	3	
Oceanography RR332	Chemical Oceanography	—	—	—	—	3	0	2	4	
Oceanography RR341	Practical Oceanography	0	0	3	1	—	—	—	—	
Engineering RR312	Applied Fluid Mechanics	—	—	—	—	4	0	2	5	
PE RR303		0	0	2	0	0	0	2	0	
Drill RR303		0	0	1	0	0	0	1	0	
Total		16	3	15	24	21	3	13	28	

NOTES — 1. Grade based on year's work with no final examination.
2. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of academic credit will be granted to a maximum of nine in the full degree program.
3. Taken in lieu of Second Language Training III by cadets who are functionally bilingual.
4. Electives are Political Science RR102, French RR212, or any 300 or 400 level course offered in Economics, English, French, History, Philosophy, or Political Science.
5. Elective may be taken in first semester with approval of Faculty Council.

Table 11

Fourth Year — General and Honours Degree in Military and Strategic Studies

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
Language Trg IV	Second Language Training	0	3	2	(3)	0	3	2	(3)	1, 2
Language Trg IVA	Second Language Training	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 3
MLM RR402	Personnel Management	—	—	—	—	3	0	0	4	
History RR411	America as a World Power	3	0	0	4	—	—	—	—	
History RR421	Twentieth Century Naval History	3	0	0	4	—	—	—	—	
History RR432	China, Japan and the Pacific in the Twentieth Century	—	—	—	—	3	0	0	4	
History RR443	Honour Thesis	(0)	(3)	(0)	(2)	(0)	(3)	(0)	(2)	6
History RR452	Soviet Russia as a World Power	—	—	—	—	3	0	0	4	
History RR471	Pacific Rim and East Asia to 1905	3	0	0	4	—	—	—	—	
Political Science RR441	Canadian Foreign Policy	3	0	0	4	—	—	—	—	7
Elective		—	—	—	—	3	0	0	4	
Elective		3	0	0	4	—	—	—	—	
Elective		—	—	—	—	3	0	0	0	4
PE RR403		0	0	2	0	0	0	2	0	
Drill RR403		0	0	1	0	0	0	1	0	
Total		15	3	5	20	15	3	5	20	5

NOTES —
1. Grade based on year's work with no final examination.
2. For each fifteen units of Dialogue Canada or its equivalent satisfactorily completed, three units of academic credit will be granted to a maximum of nine in the full degree program.
3. Taken in lieu of Language Training IV by cadets who are functionally bilingual.
4. Electives may be selected from any 300 or 400 level Arts or Science course if timetabling permits. At least one, but not more than two electives must be taken by MSS students in their third and fourth year programs from disciplines other than history and political science.
5. Semester course loadings of less than 20 or more than 24 units of credit require the prior approval of Faculty Council.
6. Required of those in the Honours Program. Regulations governing Honours thesis are available from the Head of the Department of History and Political Economy.
7. Given in alternate years commencing 1982-83.

TABLE 12

Fourth Year — General Degree in Science

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
Language Trg IV	Second Language Training	0	3	2	(3)	0	3	2	(3)	1, 3
Language Trg IVA	Second Language Training	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 2
Engineering RR312	Applied Fluid Mechanics	—	—	—	—	4	0	2	5	4
MLM RR402	Personnel Management	—	—	—	—	3	0	0	4	4
Arts Elective		3	0	0	4	—	—	—	—	
Mathematics RR401	Complex Variables	3	0	0	4	—	—	—	—	4
Mathematics RR412	Advanced Probability and Statistics	—	—	—	—	3	0	0	4	
Physics RR421	Atomic Physics	3	0	0	4	—	—	—	—	
Physics RR432	Applied Nuclear Physics	—	—	—	—	3	0	0	4	
Physics RR441	Solid State Physics with Application	3	0	3	4	—	—	—	—	4
Chemistry RR401	Applied Thermodynamics	3	0	0	4	—	—	—	—	4
Oceanography RR401	Geology and Geophysical Oceanography	3	0	0	4	—	—	—	—	
Oceanography RR412	Aeronomy	—	—	—	—	3	0	0	4	
Oceanography RR431	Practical Oceanography	0	0	3	1	—	—	—	—	1
Oceanography RR432	Practical Oceanography	—	—	—	—	0	0	3	1	1
Oceanography RR451	Introduction to Dynamic Oceanography	3	0	0	4	—	—	—	—	
Oceanography RR462	Advanced Dynamic Oceanography	—	—	—	—	3	0	0	4	
Computer Science RR401	Interfacing Computers and Peripherals	2	0	4	4	—	—	—	—	
Computer Science RR412	Operating Systems	—	—	—	—	3	0	1	4	
Computer Science RR422	Topics in Computer Science	—	—	—	—	3	0	0	4	
PE RR403		—	—	2	—	0	0	2	0	
Drill RR403		0	0	1	0	0	0	1	0	
Total										5

TABLE 12 CONT'D.

NOTES — 1. Grade based on year's work with no final examination.
2. For each fifteen units of Dialogue Canada or its equivalent satisfactorily completed, three units of academic credit will be granted to a maximum of nine in the full degree program.
3. Taken in lieu of Language Training IV by cadets who are functionally bilingual.
4. Core Course normally required.
5. At least 36 Science and 4 Arts credits with 20 from 400 level courses must be achieved during the year.

TABLE 13

Fourth Year — Combined Major in Physics and Computer Science

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
Language Trg IV	Second Language Training	0	3	2	(3)	0	3	2	(3)	1, 2
Language Trg IVA	Second Language Training	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 3
MLM RR402	Personnel Management	—	—	—	—	3	0	0	4	
Arts Elective		3	0	0	4	—	—	—	—	4
Arts Elective		—	—	—	—	3	0	0	4	4
Mathematics RR401	Complex Variables	3	0	0	4	—	—	—	—	
Mathematics RR412	Advanced probability and Statistics	—	—	—	—	3	0	0	4	
Physics RR421	Atomic Physics	3	0	0	4	—	—	—	—	
Physics RR432	Applied Nuclear Physics	—	—	—	—	3	0	0	4	
Physics RR441	Solid State Physics	3	0	3	4	—	—	—	—	
Computer Science RR401	Interfacing Computers and Peripherals	2	0	4	4	—	—	—	—	
Computer Science RR412	Operating Systems	—	—	—	—	3	0	1	4	
Computer Science RR422	Topics in Computer Systems	—	—	—	—	3	0	0	4	5
Science Elective		3	0	0	4	—	—	—	—	6
Science Elective		—	—	—	—	3	0	0	4	6
PE RR403		0	0	2	0	0	0	2	0	
Drill RR403		0	0	1	0	0	0	1	0	
Total		17	3	12	24	21	3	16	28	

NOTES —
1. Grade based on year's work with no final examination.
2. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of academic credit will be granted to a maximum of nine in the full degree program.
3. Taken in lieu of Language Training IV by cadets who are functionally bilingual.
4. Electives are Political Science RR102, French RR212, or any 300 or 400 level course offered in Economics, English, French, History, Philosophy, or Political Science.
5. Not offered every year. May be replaced by any science elective (with due regard to prerequisites and scheduling) of at least three units of credit.
6. Two science electives to be taken totalling at least 7 units of credit.

TABLE 14

Fourth Year — General or Combined Major Degree in Physics and Oceanography

Course	Description	First Semester				Second Semester				Notes
		Lect	Tut	Lab	Credits	Lect	Tut	Lab	Credits	
Language Training IV	Second Language Trg.	0	3	2	(3)	0	3	2	(3)	1, 2
Language Training IVA	Second Language Trg.	(0)	(1)	(2)	(0)	(0)	(1)	(2)	(0)	1, 3
MLM RR402	Personnel Management	—	—	—	—	3	0	0	4	
Elective		3	0	0	4	—	—	—	—	4
Elective		—	—	—	—	3	0	0	4	4
Mathematics RR401	Complex Variables	3	0	0	4	—	—	—	—	
Mathematics RR412	Advanced Probabilities and Statistics	—	—	—	—	3	0	0	4	
Physics RR421	Atomic Physics	3	0	0	4	—	—	—	—	6
Physics RR432	Applied Nuclear Physics	—	—	—	—	3	0	0	4	
Physics RR441	Solid State Physics with Applications	3	0	3	4	—	—	—	—	
Chemistry RR401	Applied Thermodynamics	3	0	0	4	—	—	—	—	
Oceanography RR401	Geology & Geophysical Oceanography	3	0	0	4	—	—	—	—	
Oceanography RR412	Aeronomy	—	—	—	—	3	0	0	4	
Oceanography RR431	Practical Oceanography	0	0	3	1	—	—	—	—	
Oceanography RR432	Practical Oceanography	—	—	—	—	0	0	3	1	1
Oceanography RR451	Introduction to Dynamics Oceanography	3	0	0	4	—	—	—	—	
Oceanography RR462	Advanced Dynamic Oceanography	—	—	—	—	3	0	0	4	
Oceanography RR483	Project	(0)	(1)	(3)	(2)	(0)	(1)	(3)	(2)	5
Oceanography RR492	Oceanography Seminar	—	—	—	—	0	0	2	0	
PE RR403		0	0	2	0	0	0	2	0	
Drill RR403		0	0	1	0	0	0	1	0	
Total		21	3	11	29	18	3	10	25	

TABLE 14 CONT'D.

NOTES —
1. Grade based on year's work with no final examination.
2. For each fifteen lessons of Dialogue Canada or equivalent satisfactorily completed, three units of academic credit will be granted to a maximum of nine in the full degree program.
3. Taken in lieu of Language Training IV by cadets who are functionally bilingual.
4. Electives are Political Science RR102, French RR212, or any 300 or 400 level course offered in Economics, English, French, History, Philosophy, or Political Science.
5. Required of cadets in the honours program only.
6. Not required of cadets in the general program.

RMC PROGRAM OUTLINES

Tables 15 to 36 outline the third and fourth year programs of study available at Royal Military College, Kingston, Ontario.

Corresponding course descriptions are not included in this calendar, but may be found in the RMC calendar.

RMC COURSE IDENTIFICATION CODE

Each course is identified by a six or seven character code.

example: EEE 319A

The first two letters indicate the Department or subject of the course; in this example it is Electrical Engineering.

The third letter indicates the language in which the course is given; either E for English, as in the above example, or F for Français (French).

The three digit course numbering indicates exactly which course in a subject area is referred to. The first digit indicates the year in which the course is normally offered. The second and third digits indicate the departmental course number.

For courses in Third and Fourth Years, an odd digit in the third position indicates a course in an Engineering Program of Study, although some of these courses may be open to students in Arts or Science. An even digit in this position indicates a course in an Arts or Science Program of Study, although some may be open to Engineers.

The course numbering for the First and Second Years indicates the year and the departmental course numbering only.

The seventh character, if present, indicates that the course is a half-course. The letter A indicates that it is given in the Fall Term and the letter B indicates a course given in the Winter Term. A code of only six characters represents a full year course.

List of Subject Codes

Listed below are the subject codes for courses given in English and their counterpart for courses given in French.

CEE — Civil Engineering	GCF — Génie civil
CHE — Chemistry	CHF — Chimie
COE — Commerce	COF — Commerce
DRE — Drill	EXF — Exercice
ECE — Economics	ECF — Économie politique
EEE — Electrical Engineering	GEF — Génie électrique
EGE — Engineering Graphics	DIF — Dessin industriel
EME — Engineering and Management	GGF — Génie et gestion
ENE — English*	ANF — Anglais*
EPE — Engineering Physics	GPF — Génie physique

FRE — French*	FRF — Français*
GOE — Geography	GOF — Géographie
HIE — History	HIF — Histoire
KEE — Chemical Engineering	GKF — Génie chimique
MAE — Mathematics	MAF — Mathématiques
MEE — Mechanical Engineering	GMF — Génie mécanique
MLE — Military Leadership and Management	LGF — Leadership et gestion militaire
NEE — Nuclear Engineering	GNF — Génie nucleaire
PEE — Physical Education	EPF — Education physique
PHE — Physics	PHF — Physique
POE — Politics	POF — Politique
PYE — Philosophy	PIF — Philosophie
SCE — Science	SCF — Sciences
SLE — Second Language*	LSF — Langue seconde*

*In the cases of these subjects the third letter of the code indicates the primary language of the majority of the students taking the course.

EXPLANATION OF NOTES ON RMC COURSE OUTLINES[1]

Numbers enclosed in parentheses within the RMC Program Outlines Tables indicate that the course they refer to are elective courses.

The letter (A) following the course number denotes that classes are normally held in the Fall Term only. The letter (B) likewise denotes Winter Term.

WEIGHTING FACTORS (RMC)

Each course will have associated with it a number denoting its weighting factor. The weighting factors for any Program of Study total 100. They are used in the determination of the overall average and the priviliges of writing supplemental examinations and repeating a year.

[1]The programs of study available in the third and fourth years at RMC and CMR are described in general terms in this Calendar. It should be noted, however, that information provided the RRMC calendar regarding the programs of study at other colleges is not official and may not be completely up-to-date. For complete accuracy, the calendars of the other colleges should be consulted and any inquiries should be directed to the Registrar of the appropriate college.

TABLE 15: Third Year Science (Applied)

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE304:	Foundations Ldrship	9	2	—	2	2	—	2	
MLE398:	Leadership Project	(9)	(2)	—	(2)	(2)	—	(2)	
One elective course in Arts, or									
MLE310		14	3	—	3	3	—	3	A
HIE300:	Canada	14	3	—	3	3	—	3	
CSE325B:	Computer Techniques	7	—	—	—	2	2	4	
MAE327:	Probability & Stats	10	2	—	2	2	—	2	B
MAE333A:	Dif'l Equations	7	3	—	3	—	—	—	
PHE331:	Applied Physics I	17	3	2	5	3	2	5	
KEE333:	Mtrls, Energy Convrn	17	3	2	5	3	2	5	
MEE389:	Shop	5	—	3	3	—	3	3	
SLE3:		0	—	5	5	—	5	5	
PEE301:		—	—	2	2	—	2	2	
DRE301:		—	—	1	1	—	1	1	
Total		100	19	15	34	18	17	35	

NOTES: A. A course may be selected in any department in the Arts Division subject to a list of preferred courses in each department and to Timetable limitations. The course selected must be approved by the Instructor. A course in language improvement, one being available in each language, may be counted as an Arts elective.

B. Part I of this course is not required of those with previous credit in an acceptable course in Statistics.

WF means Weighting Factor

TABLE 16: Third Year Honours Mathematics and Physics

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE303A:	Mgmt Techniques	4	2	—	2	—	—	—	
MLE399A:	Leadership Project	(4)	(2)	—	(2)	—	—	—	
Arts Elective		8	2	—	2	1½	—	1½	A
HIE303:	Canada	8	2	—	2	1½	—	1½	
MAE301:	Dif'l Eqns, Cmplx Var	22	4	—	4	4	—	4	
MPE300:	Qntm Mchs; At & M1 Phy	11	2	—	2	2	—	2	
PHE302:	Instrumentation	14	1	4	5	1	4	5	
PHE316B:	Therml & Statl Phys	11	—	—	—	4	—	4	
EPE307B:	Cmptr Systs & Applns	13	—	—	—	3	2	5	
EPE409A:	Elect Wave Prop	9	3	1	4	—	—	—	
SLE3:		0	—	5	5	—	5	5	
PEE301:		—	—	2	2	—	2	2	
DRE301:		—	—	1	1	—	1	1	
Total		100	16	13	29	17	14	31	

NOTES: A. See. Table 25.

WF means Weighting Factor.

TABLE 17: Third Year General Mathematics and Physics

(sample programme)

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE303A:	Mgmt Techniques	6	2	0	2	—	—	—	A
Arts elective		10	2	0	2	1½	0	1½	A
HIE303:	Canada	10	2	0	2	1½	0	1½	A
MAE305:	C Var, D.E., Bndr Val	21	3	1	4	3	1	4	B
PHE302:	Instrumentation	17	1	4	5	1	4	5	B
EEE345A:	Computer Logic	12	3	2	5	—	—	—	B
EEE351B:	Microprocessors	12	—	—	—	3	2	5	B
EPE307B:	Cmptr Systs & Applns	12	—	—	—	3	2	5	B
SLE3:		—	—	5	5	—	5	5	
PEE301:		—	—	2	2	—	2	2	
DRE301:		—	—	1	1	—	1	1	
Total		100	13	15	28	13	17	30	

NOTES: A. The courses shown are taken from Table 16. Students may choose to take those shown in Table 15.

B. The student is required, in each of the Third and Fourth Years, to select as major courses, the equivalent of a minimum of four full courses, in Mathematics (including Computer Science) and/or Physics. These courses will normally be selected from any offered to Third or Fourth Year Honours Mathematics and Physics*, or Engineering Physics, students. However, one of these four courses may be taken in Chemistry, or Engineering, subject to the appropriate Departmental approval. Any selection of courses will be subject to normal prerequisite requirements, and approval of the Dean of Science. A student will normally be required to have a mathematics and physics average of 55% in Second Year in order to be admitted to this programme.

*Another course in Mathematics may be substituted for MAE301.

WF means Weighting Factor.

TABLE 18: Third Year Fuels and Materials Engineering

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE303A:	Mgmt Techniques	4	2	—	2	—	—	—	
MLE399A:	Leadership Project	(4)	(2)	—	(2)	—	—	—	
Arts Elective		7	2	—	2	1½	—	1½	A
HIE303:	Canada	5	2	—	2	1½	—	1½	
MAE335:	D.E., Bndry Val Prbs	7	2	—	2	2	—	2	
CHE301:	Organic Chemistry	12	3	2	5	2	2	4	
CHE303A:	Thermodynamics	6	3	1	4	—	—	—	
CHE307B:	Reactions, Surfaces	9	—	—	—	4	—	4	
CHE313:	Phys & Anlt Chem Lab	9	—	4	4	—	4	4	
MSE301:	Solids-Struc, Proprts	9	2	—	2	3	—	3	
FME303B:	Energy & Fuels Engrg	7	—	—	—	3	—	3	
FME305B:	Engineering Lab	7	—	—	—	—	4	4	
FME307A:	Fluid Mechanics	5	3	—	3	—	—	—	
FME309B:	Heat & Mass Transfer	6	—	—	—	3	—	3	
EEE315A:	Electrical Systems	7	3	3	6	—	—	—	
SLE3:		0	—	5	5	—	5	5	
PEE301:		—	—	2	2	—	2	2	
DRE301:		—	—	1	1	—	1	1	
Total		100	22	18	40	20	18	38	

NOTES: A. See Table 26.

WF means Weighting Factor.

TABLE 19: Third Year Civil Engineering

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE303A:	Mgmt Techniques	4	2	—	2	—	—	—	
MLE399A:	Leadership Project	(4)	(2)	—	(2)	—	—	—	
Arts Elective		7	2	—	2	1½	—	1½	A
HIE303:	Canada	5	2	—	2	1½	—	1½	
CEE301A	Strength of Materls	7	3	2	5	—	—	—	
CEE307B:	Structural Theory	9	—	—	—	3	2	5	
CEE311B:	Engineering Materials	7	—	—	—	3	1	4	
CEE313A:	Civ Eng Analysis	6	3	1	4	—	—	—	
CEE353B:	Engineering Geology	7	3	2	5	—	—	—	
CEE355B:	Soil Mechanics	9	—	—	—	3	2	5	
CEE361:	Engineering Surveys	11	4	1	5	3	—	3	
CEE363B:	Survey Field School*	6							
CEE367B:	Terrain Analysis	6	—	—	—	2½	1½	4	
CEE381A:	Elec/Therm Systems	7	3	2	5	—	—	—	
MEE315B:	Fluid Mechanics	9	—	—	—	3	2	5	
SLE3:		0	—	5	5	—	5	5	
PEE301:		—	—	2	2	—	2	2	
DRE301:		—	—	1	1	—	1	1	
Total		100	22	16	38	20½	16½	37	

*The duration of the Winter Term is 14 weeks followed by a two-week examination period. The two-week survey field school is held immediately after the examinations.

NOTES: A. See Table 26.

WF means Weighting Factor.

TABLE 20: Third Year Electrical Engineering

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE303A:	Mgmt Techniques	4	2	—	2	—	—	—	
MLE399A:	Leadership Project	(4)	(2)	—	(2)	—	—	—	
Arts Elective		7	2	—	2	1½	—	1½	A
HIE303:	Canada	5	2	—	2	1½			
MAE301:	Dif'l eqns, Complx Var	(14)	(4)	—	(4)	(4)	—	(4)	B
MAE305:	C Var, D.E., Bndr Val	14	3	1	4	3	1	4	
EEE331B:	Energy Conversion	10	—	—	—	3	3	6	
EEE341A:	El. Dev. & Ccts.	9	4	2	6	—	—	—	
EEE343A:	Circuit Fundamentals	8	3	2	5	—	—	—	
EEE345A:	Computer Logic	8	3	2	5	—	—	—	
EEE351B:	Microprocessors	9	—	—	—	3	2	5	
EEE353B:	Circuits & Fields	9	—	—	—	3	2	5	
EEE355B:	Cmptr Program Design	10	—	—	—	3	3	6	
MEE357A:	Appld Thermodynamics	7	2	2	4	—	—	—	
SLE3:		0	—	5	5	—	5	5	
PEE301:		—	—	2	2	—	2	2	
DRE301:		—	—	1	1	—	1	1	
Total		100	21	17	38	18	19	37	

NOTES: A. See Table 26.

B. Those candidates who have completed MAE217 & MAE221 in Second Year and have achieved a Mathematics and Physics average of at least 66% may elect MAE301 instead of MAE305.

WF means Weighting Factor.

TABLE 21: Third Year Engineering Physics

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE303A:	Mgmt Techniques	4	2	—	2	—	—	—	
MLE399A:	Leadership Project	(4)	(2)	—	(2)	—	—	—	
Arts Elective		7	2	—	2	1½	—	1½	A
HIE303:	Canada	5	2	—	2	1½	—	1½	
MAE301:	Dif'l eqns, Cmplx Var	15	4	—	4	4	—	4	
MPE300:	Qntm Mchs; At & Ml Phys	8	2	—	2	2	—	2	
PHE316B:	Thermal & Statl Phys	8	—	—	—	4	—	4	
EPE305:	Laboratory	7	—	4	4	—	4	4	
EPE307B:	Cmptr Systs & Applns	10	—	—	—	3	2	5	
MSE301:	Solids-Struc, Proprts	(10)	(2)	—	(2)	(3)	—	(3)	3
FME307A:	Fluid Mechanics	(6)	(3)	—	(3)	—	—	—	3
FME309B:	Heat & Mass Transfer	(6)	—	—	—	(3)	—	(3)	3
EEE315A:	Electrical Systems	(7)	(3)	(3)	(6)	—	—	—	3
EEE341A:	El. Dev. & Ccts.	10	4	2	6	—	—	—	1, 2
EEE343A:	Circuit Fundamentals	8	3	2	5	—	—	—	1, 2
EEE345A:	Computer Logic	8	3	2	5	—	—	—	1, 2
EEE351B:	Microprocessors	10	—	—	—	3	2	5	1, 2
MEE331A:	Strength of Matrls	(7)	(3½)	(1)	(4½)	—	—	—	3
SLE3:		0	—	5	5	—	5	5	
PEE301:		—	—	2	2	—	2	2	
DRE301:		—	—	1	1	—	1	1	
Total		100	22 (23½)	18 (16)	40 (39½)	19 (22)	16 (14)	35 (36)	1, 2 3

TABLE 21 CONT'D.

NOTES: A. See Table 26.

1, 2, 3, - These are stream numbers, applicable to both Third and Fourth Years. A coherent stream of engineering courses, subject to the approval of the Professor-in-Charge of Engineering Physics and the Heads of the Engineering Departments concerned, must be selected. A selection of courses with the same stream number would represent one such possibility.

WF means Weighting Factor.

TABLE 22: Third Year Mechanical Engineering

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE303A:	Mgmt Techniques	4	2	—	2	—	—	—	
MLE399A:	Leadership Project	(4)	(2)	—	(2)	—	—	—	
Arts Elective		7	2	—	2	1½	—	1½	A
HIE303:	Canada	5	2	—	2	1½	—	1½	
MAE301:	Dif'l Eqns, Cmplx Var	(12)	(4)	—	(4)	(4)	—	(4)	B
MAE329:	D.E., Bndr Val, C Var	12	3	1	4	3	1	4	
EEE319B:	Elect Technology I	9	—	—	—	3	2	5	
MEE301B:	Machine Design	9	—	—	—	3	2	5	
MEE311B:	Fluid Dynamics	12	—	—	—	4	2	6	
MEE331A:	Strength of Matrls	7	3½	1	4½	—	—	—	
MEE333A:	Metlrgy & Engr Mtrls	7	3½	1	4½	—	—	—	
MEE335B:	Shopwork	0	—	—	—	—	3	3	
MEE345A:	Applied Mechanics	9	4	2	6	—	—	—	
MEE351A:	Thermodynamics	12	5	2	7	—	—	—	
MEE381B:	Engrg Experimentation	7	—	—	—	3	1	4	
SLE3:		0	—	5	5	—	5	5	
PEE301:		—	—	2	2	—	2	2	
DRE301:		—	—	1	1	—	1	1	
Total		100	25	15	40	21	19	38	

NOTES: A. See Table 26.

B. Elective instead of MAE329 for students having passed MAE217 and 221 and obtaining a Mathematics and Physics average of at least 66 per cent.

WF means Weighting Factor.

TABLE 23: Third Year Computer Engineering

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE303A:	Mgmt Techniques	4	2	—	2	—	—	—	
MLE399A:	Leadership Project	(4)	(2)	—	(2)	—	—	—	
Arts Elective		7	2	—	2	1½	—	1½	A
HIE303:	Canada	5	2	—	2	1½	—	1½	
MAE301:	Dif'l eqns, Cmplx Var	(14)	(4)	—	(4)	(4)	—	(4)	B
MAE305:	C Var, D.E., Bndr Val	14	3	1	4	3	1	4	
EEE331B:	Energy Conversion	10	—	—	—	3	3	6	
EEE341A:	El. Dev. & Ccts.	9	4	2	6	—	—	—	
EEE343A:	Circuit Fundamentals	8	3	2	5	—	—	—	
EEE345A:	Computer Logic	8	3	2	5	—	—	—	
EEE351B:	Microprocessors	9	—	—	—	3	2	5	
EEE353B:	Circuits & Fields	9	—	—	—	3	2	5	
EEE355B:	Cmptr Program Design	10	—	—	—	3	3	6	
MEE357A:	Appld Thermodynamics	7	2	2	4	—	—	—	
SLE3:		0	—	5	5	—	5	5	
PEE301:		—	—	2	2	—	2	2	
DRE301:		—	—	1	1	—	1	1	
Total		100	21	17	38	18	19	37	

NOTES: A. See Table 26.

B. Those candidates who have completed MAE217 & MAE221 in Second Year and have achieved a Mathematics and Physics average of at least 66% may elect MAE301 instead of MAE305.

WF means Weighting Factor.

TABLE 24: Third Year Engineering and Management

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE303A:	Mgmt Techniques	4	2	—	2	—	—	—	
MLE399A:	Leadership Project	(4)	(2)	—	(2)	—	—	—	
Arts Elective		7	2	—	2	1½	—	1½	A
HIE303:	Canada	5	2	—	2	1½	—	1½	
MAE319:	Stats, Prob	14	3	1	4	3	1	4	
MAE339A:	D.E. Bndr Val Prob	5	2	1	3	—	—	—	
EEE319B:	Electr Technology I	9	—	—	—	3	2	5	
EME301B:	Prod Mgmt I	9	—	—	—	2	2	4	
EME303A:	Engr Economy	10	3	2	5	—	—	—	
EME305A:	Mgmnt Info Systems	6	3	1	4	—	—	—	
EME307B:	Math Methods of OR	9	—	—	—	2	2	4	
MEE333A:	Metlrgy & Engr Mtrls	8	3½	1	4½	—	—	—	
MEE349B:	App Mechs, Strs Anal	6	—	—	—	3	—	3	
MEE359B:	Appld Thermodynamics	8	—	—	—	2	2	4	
MEE383A:	Shopwork	0	—	3	3	—	—	—	
SLE3:		0	—	5	5	—	5	5	
PEE301:		—	—	2	2	—	2	2	
DRE301:		—	—	1	1	—	1	1	
Total		100	20½	17	37½	18	17	35	

NOTES: A. See Table 26. ECE301 must be selected in either Third or Fourth Year.

WF means Weighting Factor.

TABLE 25: Third and Fourth Year Arts

Courses offered in 1982-83 are marked with an asterisk (*).			Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE303A:	Mgmt Techniques	*	2	—	2	—	—	—	A
MLE304:	Foundations Ldrshp	*	2	—	2	2	—	2	B
MLE310:	Personality Theories	*	3	—	3	3	—	3	
MLE320:	Soclgy Mil'y Profssn	*	3	—	3	3	—	3	
MLE398:	Leadership Project		(2)	—	(2)	(2)	—	(2)	
MLE399A:	Leadership Project	*	(2)	—	(2)	—	—	—	
MLE403:	Mil'y Persnnl System	*	1½	—	1½	2	—	2	C
MLE499:	Personnel Management		(1½)	—	(1½)	(2)	—	(2)	
ANF302:	Gram, pron, lectures	*	3	—	3	3	—	3	
ENE304:	Eng Lit Ren-Restor		3	—	3	3	—	3	
ENE310:	Canadian Lit	*	3	—	3	3	—	3	
ENE312:	Eng Novel to 1916	*	3	—	3	3	—	3	
ENE314B:	History of the Lang	*	—	—	—	3	—	3	
ENE320:	American Lit to 1900	*	3	—	3	3	—	3	
ENE324A:	Literary Principles	*	3	—	3	—	—	—	
ENE402:	Old & Middle Eng Lit	*	3	—	3	3	—	3	
ENE408:	Restor & 18C Eng Lit	*	3	—	3	3	—	3	
ENE410:	19C English Lit	*	3	—	3	3	—	3	
ENE416:	20C English Lit	*	3	—	3	3	—	3	
ENE420:	20C American Lit		3	—	3	3	—	3	
ENE428:	English Drama	*	3	—	3	3	—	3	

TABLE 25 CONT'D.

PYE304:	Logic & Moral Phil		3	—	3	3	—	3		
PYE314:	Political Philosophy		3	—	3	3	—	3		
PYE404:	Modern Philosophy	*	3	—	3	3	—	3		
PYE420:	20th C Philosophy		3	—	3	3	—	3		
FRE304:	Translation I	*	3	—	3	3	—	3		
FRF310:	Lit & civ can-fr.		3	—	3	3	—	3		
FRF312:	Stylistique comparé	*	3	—	3	3	—	3		
FRE314:	Fr Civilization	*	3	—	3	3	—	3		
FRF366:	Hist Litt Franc I		3	—	3	3	—	3		
FRF466:	Hist Litt Franc II	*	3	—	3	3	—	3		
HIE300:	Canada	*	3	—	3	3	—	3	D	
HIE302:	Gt Powers 1815-1945	*	3	—	3	3	—	3		
HIE306:	French Revn & Napol	*	3	—	3	3	—	3		
HIF306:	Rev'n Franc. & Napol	*	(3)	—	(3)	(3)	—	(3)		
HIE312:	Medieval Europe	*	3	—	3	3	—	3		
HIE314:	Can Dfnce Plcy 1867-	*	3	—	3	3	—	3		
HIE322:	History of the U.S.		3	—	3	3	—	3		
HIE330:	Warfare and Society	*	3	—	3	3	—	3		
HIE340:	Eng Rev'n 1485-1715		3	—	3	3	—	3		
HIE408:	U.S. as World Power	*	3	—	3	3	—	3		
HIE410:	Commonwealth Defence	*	3	—	3	3	—	3		
HIE414:	World Wars I & II	*	3	—	3	3	—	3		
HIE416:	Russian Revolution	*	3	—	3	3	—	3		
HIE418:	Modern East Asia	*	3	—	3	3	—	3		
HIE420:	Canada in 20th Cent	*	3	—	3	3	—	3		
HIF420:	Canada au XXe siècle		(3)	—	(3)	(3)	—	(3)		
HIE422:	Naval, Mrtme Stratgy	*	3	—	3	3	—	3		

TABLE 25 CONT'D.

HIE424:	Dissertation	*	1	2	3	—	3	3
HIE428:	Modern Britain	*	3	—	3	3	—	3
HIE432:	Imperialism 1850-		3	—	3	3	—	3
HIE434:	Strategic Theory	*	3	—	3	3	—	3
HIE436:	Civil-Miltry Relatns	*	3	—	3	3	—	3
HIE438:	War, Diplomacy 1946-	*	3	—	3	3	—	3
ECE306:	Macroeconomics	*	3	—	3	3	—	3
ECE314B:	Economic Development	*	—	—	—	3	—	3
ECE316A:	Canadian Ec History	*	3	—	3	—	—	—
ECE318B:	Internatl Ec Problems	*	—	—	—	3	—	3
ECE324:	Microeconomics	*	3	—	3	3	—	3
ECE370A:	Statistical Analysis	*	3	—	3	—	—	—
ECE372B:	Quant. Analysis I	*	—	—	—	3	—	3
ECE410:	Public Finance	*	3	—	3	3	—	3
ECE416:	International Trade	*	3	—	3	3	—	3
ECE422A:	Compr Econmc Systems	*	3	—	3	—	—	—
ECE424B:	Economics of Defence	*	—	—	—	3	—	3
ECE440:	Quant. Analysis II	*	3	—	3	3	—	3
COE304:	Princs of Accounting	*	3	—	3	3	—	3
COE320B:	Business Law	*	—	—	—	3	—	3
COE322A:	Business Admin	*	3	—	3	—	—	—
COE370A:	"see ECE370A"		3	—	3	—	—	—
COE372B:	"see ECE372B"		—	—	—	3	—	3
COE404A:	Interm. Accounting	*	3	—	3	—	—	—
COE418A:	Mng Accntg & Control	*	3	—	3	—	—	—
COE424A:	Business Finance	*	3	—	3	—	—	—
COE426B:	Bus Pol & Mktg Strat	*	—	—	—	3	—	3

TABLE 25 CONT'D.

POE204:	Intro to Govt & Pol	*	3	—	3	3	—	3	
POF304:	Instns gouv & la pol	*	(3)	—	(3)	(3)	—	(3)	
POE306:	"see PYE314"								
POE314:	"see HIE314"								
POE316:	Intro Intntl Relns	*	3	—	3	3	—	3	
POE320:	Comparative Politics	*	3	—	3	3	—	3	
POE326:	Canadian Government	*	3	—	3	3	—	3	
POE330:	Public Admin	*	3	—	3	3	—	3	
POE418:	Political Analysis	*	3	—	3	3	—	3	
POE422:	Contempry Intl Probs	*	3	—	3	3	—	3	
POE424:	Third World Politics		3	—	3	3	—	3	
GOE302:	Wrld Regional Survey	*	3	—	3	3	—	3	
GOE304:	Man's Phys Envirmnt		3	—	3	3	—	3	
GOE402:	Geographic Problems		3	—	3	3	—	3	
GOE404:	Pol & Mil Geography	*	3	—	3	3	—	3	
GOE408:	Oceanography		3	—	3	3	—	3	
MAE381A:	Discrete Structures	*	3	1	4	—	—	—	E
CSE391A:	Intro-Computer Systems	*	2	3	5	—	—	—	E
CSE393B:	Progg w Applications	*	—	—	—	2	3	5	E
SLE3:		*	—	5	5	—	5	5	
SLE4:		*	—	5	5	—	5	5	
PEE301:		*	—	2	2	—	2	2	
PEE401:		*	—	2	3	—	2	2	
DRE301:		*	—	1	1	—	1	1	
DRE401:		*	—	1	1	—	1	1	
Total (minimum)	Third Year		17	8	25	17	8	25	
	Fourth Year		16½	8	24½	17	8	25	

TABLE 25: CONT'D.

NOTES:
A. In Third Year students in Honours take MLE303, 2 hours per week for one term only. The Weighting Factor (see Academic Regulation 36) is 4 for MLE, and 16 for each of the other six courses.

B. Third Year students in General courses normally take MLE304. The WF is 10 for MLE, and 18 for each of the other five courses.

C. MLE403 has a WF of 10. Full courses for Fourth Year students in Honours are weighted 15 each (with a Fall-7, Winter-8 split for one-term courses). Full courses for students in General Courses of Study are weighted 18 each.

D. Required of students who have not taken an equivalent course.

E. Elective for students taking Economics or Commerce.

For details of Courses of Study see the entries under the respective Departments. Military and Strategic Studies is listed under both History and Political and Economic Science.

TABLE 26: Third and Fourth Year Engineering and Mathematics and Physics Elective Arts Courses

Courses offered in 1982-83 are marked with an asterisk (*).			Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE309:	Personality Theories	*	2	—	2	1½	—	1½	
ENE301:	Readings in Lit		2	—	2	1½	—	1½	
ANF303:	Gram, pron, lectures	*	1	1	2	1	½	1½	
ENE401:	Rdings in Recent Lit	*	2	—	2	1½	—	1½	
PYE301:	Logic, Probs of Phil	*	2	—	2	1½	—	1½	
FRE303:	Translation I	*	2	—	2	1½	—	1½	
FRF309:	Lit & civ can-fr.		2	—	2	1½	—	1½	
FRF311:	Trad'n et styl comp	*	2	—	2	1½	—	1½	
FRE313:	Fr Civilization	*	2	—	2	1½	—	1½	
FRE403:	Translation II	*	2	—	2	1½	—	1½	
FRF405:	Civilisation can-fr	*	2	—	2	1½	—	1½	
HIF307:	Rev'n franc. & Napol	*	2	—	2	1½	—	1½	
HIE415:	Selected Campaigns	*	2	—	2	1½	—	1½	
HIF415:	Campagnes choisies		2	—	2	1½	—	1½	
HIE423:	Naval History		2	—	2	1½	—	1½	
ECE301:	Publ Fin & Defnc Eco	*	2	—	2	1½	—	1½	
ECF301:	Fin Publ & éc de déf	*	2	—	2	1½	—	1½	
POE401:	Introd to Politics	*	2	—	2	1½	—	1½	
POF401:	Introd à la politique	*	2	—	2	1½	—	1½	
GOE309:	Intro-Oceanography		2	—	2	1½	—	1½	
Additional elective for Fourth Year									
GOE301:	World Survey	*	2	—	2	1½	—	1½	

TABLE 27: Fourth Year Science (Applied)

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE403:	Mil'y Persnnl System	9	1½	—	1½	2	—	2	
MLE499:	Personnel Management	(9)	(1½)	—	(1½)	(2)	—	(2)	
One elective course in Arts, or									
MLE310		14	3	—	3	3	—	3	A
MAE433:	Math Methods of O.R.	15	3	—	3	3	—	3	
PHE431:	Contemp'y Appld Phys	18	2	3	5	2	3	5	B
EEE499:	Pwr & Electrnc Systms	20	2	3	5	2	3	5	
MEE419B:	Appl Fluid Mechanics	14	—	—	—	4	2	6	
MEE459A:	Appl Thermodynamics	10	3	2	5	—	—	—	
SLE4:		0	—	5	5	—	5	5	
PEE401:		—	—	2	2	—	2	2	
DRE401:		—	—						
Total		100	14½	16	30½	16	16	32	

NOTES: A. Any course for students taking Arts may be selected, subject to Timetable limitations and permission of the instructor.

B. Includes four free lab periods.

WF means Weighting Factor

TABLE 28: Fourth Year General Mathematics and Physics

(sample programme)

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE403:	Mil'y Persnnl System	12	1½	—	1½	2	—	2	
MLE499:	Personnel Management	(12)	(1½)	—	(1½)	(2)	—	(2)	
Arts Elective		12	2	—	2	1½	—	1½	A
MAE417A:	Numerical Analysis	8	2	—	2	—	—	—	B
MPE420:	Senior Project	14	—	2	2	—	6	6	B
EEE481B:	Software Engineering	14	—	—	—	3	2	5	B
EEE483A:	Data Base Management	14	3	2	5	—	—	—	B
EPE407B:	Applied Optics	14	—	—	—	3	2	5	B
EPE409A:	Elect. Wave Prop	12	3	1	4	—	—	—	B
SLE4:		0	—	5	5	—	5	5	
PEE401:		—	—	2	2	—	2	2	
DRE401:		—	—	1	1	—	1	1	
Total		100	11½	13	24½	9½	18	27½	

NOTES: A. See Table 26. A course may be selected from Table 25 instead.

B. The student is required, in each of the Third and Fourth Years, to select as major courses the equivalent to a minimum of four full courses in Mathematics (including Computer Science) and/or Physics. These courses will normally be selected from any offered to Third and Fourth Year Honours Mathematics and Physics or Engineering Physics students. However, one of these four courses may be taken in Chemistry, or Engineering, subject to the appropriate Departmental approval. Any selection of courses will be subject to normal prerequisite requirements, and approval of the Dean of Science.

WF means Weighting Factor.

TABLE 29: Fourth Year Honours Mathematics and Physics

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE403:	Mil'y Persnnl System	9	1½	—	1½	2	—	2	
MLE499:	Personnel Management	(9)	(1½)	—	(1½)	(2)	—	(2)	
Arts Elective		9	2	—	2	1½	—	1½	A
MAE417A:	Numerical Analysis	5	2	—	2	—	—	—	B
MAE440:	Special Topics	15	3	—	3	3	—	3	
MAE443A:	Quantum Mechanics II	5	2	—	2	—	—	—	
MPE420:	Senior Project	13	—	2	2	—	6	6	
PHE401A:	Nuclear Physics	7	3	—	3	—	—	—	
PHE403:	Solid State Physics	10	2	—	2	2	—	2	
PHE440:	Selected Topics	10	2	—	2	2	—	2	
EPE403B:	Classical Mechanics	10	—	—	—	3	—	3	
EPE406B:	Applied Optics	7	—	—	—	2	2	4	
SLE4:		0	—	5	5	—	5	5	
PEE401:		—	—	2	2	—	2	2	
DRE401:		—	—	1	1	—	1	1	
Total		100	17½	10	27½	15½	16	31½	

NOTES: A. See Table 26.

B. If this course is not offered, the students will be required to take an alternate course.

WF means Weighting Factor.

TABLE 30: Fourth Year Fuels and Materials Engineering

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE403:	Mil'y Personnl System	7	1½	—	1½	2	—	2	
MLE499:	Personnel Management	(7)	(1½)	—	(1½)	(2)	—	(2)	
Arts Elective		7	2	—	2	1½	—	1½	A
FME401A:	Electrochemical Power	5	3	—	3	—	—	—	
FME403B:	Corrosion Engrg	6	—	—	—	3	—	3	
FME405A:	Separ'n Ops Design	6	4	—	4	—	—	—	
FME407A:	Reaction Engineering	5	3	—	3	—	—	—	B
FME409A:	Combustion Engrg	5	3	—	3	—	—	—	
FME411A:	Engrg Thermodynamics	6	4	—	4	—	—	—	
FME413B:	Modelling, Optimization	6	—	—	—	3	—	3	
FME415B:	Control Systems	6	—	—	—	3	—	3	
FME417B:	Design Project	8	—	—	—	—	6	6	
FME419:	Engineering Lab	8	—	4	4	—	4	4	
FME421B:	Polymer Engineering	(8)	—	—	—	(4)	—	(4)	C
FME423B:	Synthetic Materials	8	—	—	—	4	—	4	C
NEE409A:	Nuclear Technology	6	4	—	4	—	—	—	
NEE411B:	Nuclear Power Srces	8	—	—	—	4	—	4	
EME415A:	Engrg Project Mngmnt	(5)	(3)	—	(3)	—	—	—	B
MEE457A:	Heat Engines Lab	3	—	3	3	—	—	—	
SLE4:		0	—	5	5	—	5	5	
PEE401:		—	—	2	2	—	2	2	
DRE401:		—	—	1	1	—	1	1	
Total		100	24½	15	39½	20½	18	38½	

TABLE 30 CONT'D.

NOTES: A. See Table 26.

B. One course to be selected.

C. One course to be selected.

WF means Weighting Factor.

TABLE 31: Fourth Year Civil Engineering

(Commencing 1983-84)

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE403A:	Mil'y Persnnl System	7	1½	—	1½	2	—	2	
MLE499:	Personnel Management	(7)	(1½)	—	(1½)	(2)	—	(2)	
Arts Elective		7	2	—	2	1½	—	1½	A
CEE401A:	Adv Struct Theory	7	3	2	5	—	—	—	
CEE403A:	Intr Conc Reinf Conc	6	2	2	4	—	—	—	
CEE415B:	Reinf Conc Design	9	—	—	—	3	2	5	
CEE417A:	Steel Design	7	3	2	5	—	—	—	
CEE457B:	Foundat'ns, Earthwks	10	—	—	—	4	2	6	
CEE483A:	Hydr & Eng Hydrology	7	3½	1½	5	—	—	—	
CEE485B:	Sanitary & Env Eng	10	—	—	—	4	2	6	
CEE487A:	Highway Design	7	3	2	5	—	—	—	
CEE489B:	Transp & Planning	9	—	—	—	3	2	5	
CEE493:	CE Project	14	1	3	4	—	4	4	
SLE4:		0	—	5	5	—	5	5	
PEE401:		—	—	2	2	—	2	2	
DRE401:		—	—	1	1	—	1	1	
Total		100	19	20½	39½	17½	20	37½	

NOTES: A. See Table 26.

WF means Weighting Factor.

TABLE 32: Fourth Year Electrical Engineering

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE403:	Mil'y Persnnl System	7	1½	—	1½	2	—	2	
MLE499:	Personnel Management	(7)	(1½)	—	(1½)	(2)	—	(2)	
Arts Elective		7	2	—	2	1½	—	1½	A
EEE403A:	Electronic Circuits	8	3	2	5	—	—	—	
EEE405B:	Advanced Electronics	9	—	—	—	3	2	5	
EEE411A:	Communication & Prop	8	3	2	5	—	—	—	
EEE417A:	Electrom Prop & Rdn	8	3	2	5	—	—	—	B
EEE427A:	Control Systems I	8	3	2	5	—	—	—	
EEE429A:	Elec Machines, Power	(8)	(3)	(2)	(5)	—	—	—	B
EEE431B:	Digital Communictns	9	—	—	—	3	2	5	C
EEE435B:	Weapons Syst Analys	9	—	—	—	3	2	5	C
EEE441B:	Microwave Systems	9	—	—	—	3	2	5	C
EEE443B:	Adv Network Theory	(9)	—	—	—	(3)	(2)	(5)	C
EEE445B:	Pwr Distribution Sys	(9)	—	—	—	(3)	(2)	(5)	C
EEE447B:	Control Systems II	(9)	—	—	—	(3)	(2)	(5)	C
EEE449B:	Pwr Semicndctr Sstms	(9)	—	—	—	(3)	(2)	(5)	C
EEE457:	Design Project	10	—	2	2	—	6	6	
EEE467A:	Interfacing Tech.	8	3	2	5	—	—	—	
EEE469B:	Adv. Computer Arch.	(9)	—	—	—	(3)	(2)	(5)	C
EEE479B:	Simulation & Design	(9)	—	—	—	(3)	(2)	(5)	C
EEE481B:	Software Engineering	(9)	—	—	—	(3)	(2)	(5)	C

TABLE 32 CONT'D.

Non-EE Elective	(9)	—	—	—	(3)	(2)	(5)	C
SLE4:	0	—	5	5	—	5	5	
PEE401:	—	—	2	2	—	2	2	
DRE401:	—	—	1	1	—	1	1	
Total	100	18½	20	38½	15½	22	37½	

NOTES: A. See Table 26.

B. A student may take only one of these courses.

C. Elective courses. A total of three must be selected in the Winter Term. A student may choose three EE courses or two EE courses and one non-EE course. The non-EE course must be chosen from suitable courses given in Mathematics, Science, or another Engineering Department. In this case approval is required from the Head of both the EE Department and the other Department concerned.

Selection of courses is subject to timetabling and prerequisite constraints.

WF means Weighting Factor.

TABLE 33: Fourth Year Engineering Physics

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE403:	Mil'y Persnnl System	7	1½	—	1½	2	—	2	
MLE499:	Personnel Management	(7)	(1½)	—	(1½)	(2)	—	(2)	
Arts Elective		7	2	—	2	1½	—	1½	A
MAE443A:	Quantum Mechanics II	4	2	—	2	—	—	—	
PHE401A:	Nuclear Physics	6	3	—	3	—	—	—	
PHE403:	Solid State Physics	8	2	—	2	2	—	2	
EPE403B:	Classical Mechanics	6	—	—	—	3	—	3	
EPE405:	Eng Design Project	9	—	2	2	—	6	6	
EPE407B:	Applied Optics	8	—	—	—	3	2	5	
EPE409A:	Elect. Wave Prop.	6	3	1	4	—	—	—	
FME411A:	Engineering Thermo	7 (6)	4	—	4	—	—	—	1, 3
FME415B:	Control Systems	(6)	—	—	—	(3)	—	(3)	3
FME489B:	Engr Lab — Winter	(4)	—	—	—	—	(4)	(4)	3
NEE411B:	Nuclear Power Srces	9 (8)	—	—	—	4	—	4	1, 3
EEE411A:	Communictns & Prop'n	7	3	2	5	—	—	—	1
EEE427A:	Control Systems I	7	3	2	5	—	—	—	1, 2
EEE447B:	Control Systems II	9	—	—	—	3	2	5	1 (2)
EEE467A:	Interfacing Tech	(7)	(3)	(2)	(5)	—	—	—	2
EEE469B:	Adv. Computer Arch.	(9)	—	—	—	(3)	(2)	(5)	2
EEE481B:	Software Engineering	(9)	—	—	—	(3)	(2)	(5)	2
EEE483A:	Data Base Management	(7)	(3)	(2)	(5)	—	—	—	(1) 2
MEE411A:	Fluid Dynamics	(9)	(4½)	(2)	(6½)	—	—	—	3

TABLE 33 CONT'D.

MEE441A: Stress Analysis	(6)	(2½)	(2)	(4½)	—	—	—	3
SLE4:	0	—	5	5	—	5	5	
PEE401:	—	—	2	2	—	2	2	
DRE401:	—	—	1	1	—	1	1	
Total	100	23½	15	38½	18½	18	36½	1
		(22½)	(17)	(39½)	(17½)	(20)	(37½)	2
		(24½)	(15)	(39½)	(18½)	(20)	(38½)	3

NOTES: A. See Table 26.

1, 2, 3, - These are stream numbers, applicable to both Third and Fourth Years. A coherent stream of engineering courses, subject to the approval of the Professor-in-Charge of Engineering Physics and the Heads of the Engineering Departments concerned must be selected. A selection of courses with the same stream number would represent one such possibility. Stream 3 will be available in the Fourth Year beginning in 1983-84.

WF means Weighting Factor.

TABLE 34: Fourth Year Mechanical Engineering

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE403:	Mil'y Persnnl System	7	1½	—	1½	2	—	2	
MLE499:	Personnel Management	(7)	(1½)	—	(1½)	(2)	—	(2)	
Arts Elective		7	2	—	2	1½	—	1½	A
EME483B:	Relbty & Maintnblty	8	—	—	—	3	1	4	B
MEE403B:	Dsng of Engrg Systems	8	—	—	—	3	1	4	B
MEE411A:	Fluid Dynamics	12	4½	2	6½	—	—	—	
MEE421B:	Heat Transfer	12	—	—	—	4	2	6	
MEE441A:	Stress Analysis	7	2½	2	4½	—	—	—	
MEE445A:	Dynamic Systems	12	4½	2	6½	—	—	—	
GMF451B:	Moteurs à combustion	8	—	—	—	3	1	4	B
MEE455B:	Thermal Envir Engrg	(8)	—	—	—	(3)	(1)	(4)	B
MEE461B:	Aeron, Space Proplsn	(8)	—	—	—	(3)	(1)	(4)	B
MEE471:	Engineering Project	10	—	3	3	—	6	6	
MEE487A:	Thermodynamics	9	4	1½	5½	—	—	—	
SLE4:		0	—	5	5	—	5	5	
PEE401:		—	—	2	2	—	2	2	
DRE401:		—	—	1	1	—	1	1	
Total		100	19	18½	37½	16½	19	35½	

NOTES: A. See Table 26.

B. Three courses to be selected.

WF means Weighting Factor.

TABLE 35: Fourth Year Computer Engineering

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE403:	Mil'y Persnnl System	7	1½	—	1½	2	—	2	
MLE499:	Personnel Management	—	(1½)	—	(1½)	(2)	—	(2)	
Arts Elective		7	2	—	2	1½	—	1½	A
EEE403A:	Electronic Circuits	8	3	2	5	—	—	—	
EEE411A:	Communication & Prop	(8)	(3)	(2)	(5)	—	—	—	B
EEE427A:	Control Systems I	8	3	2	5	—	—	—	B
EEE431B:	Digital Communications	(9)	—	—	—	(3)	(2)	(5)	D
EEE435B:	Weapons Syst Analys	(9)	—	—	—	(3)	(2)	(5)	D
EEE447B:	Control Systems II	(9)	—	—	—	(3)	(2)	(5)	D
EEE457:	Design Project	10	—	2	2	—	6	6	
EEE467A:	Interfacing Tech.	8	3	2	5	—	—	—	
EEE469B:	Adv. Computer Arch.	9	—	—	—	3	2	5	
EEE471B:	Op System Principles	(9)	—	—	—	(3)	(2)	(5)	C
EEE473B:	Comp. Communications	9	—	—	—	3	2	5	C
EEE475A:	Optimization, Approx	8	3	2	5	—	—	—	
EEE477B:	Computer Graphics	9	—	—	—	3	2	5	C
EEE479B:	Simulation & Design	9	—	—	—	3	2	5	C
EEE481B:	Software Engineering	(9)	—	—	—	(3)	(2)	(5)	C
EEE483A:	Data Base Management	8	3	2	5	—	—	—	B
Non-EE Elective		(9)	—	—	—	(3)	(2)	(5)	D
SLE4:		0	—	5	5	—	5	5	

TABLE 35 CONT'D.

PEE401:	—	—	2	2	—	2	2	
DRE401:	—	—	1	1	—	1	1	
Total	100	18½	20	38½	15½	22	37½	

NOTES: A. See Table 26.

B. Two courses selected from this group.

C. Three courses selected from this group.

D. One or more courses from these elective courses may be substituted in place of courses in group C. One course may be chosen from suitable courses given in Mathematics, Science, or another Engineering Department. In this case approval is required from the Head of both EE Department and the other Department concerned.

Selection of courses is subject to timetabling and prerequisite constraints.

WF means Weighting Factor.

TABLE 36: Fourth Year Engineering and Management

		WF	Fall Term — Periods/Week			Winter Term — Periods/Week			NOTES
			Lect.	Lab.	Total	Lect.	Lab.	Total	
MLE403:	Mil'y Persnnl System	7	1½	—	1½	2	—	2	1
MLE499:	Personnel Management	(7)	(1½)	—	(1½)	(2)	—	(2)	
Arts Elective		7	2	—	2	1½	—	1½	A
EEE419B:	Electr Technology II	11	—	—	—	3½	2½	6	
EME401A:	Prod Mgmt II	10	3	2	5	—	—	—	
EME403B:	Management Seminar	7	—	—	—	2	2	4	
EME405:	Engineering Report	10	—	4	4	—	4	4	
EME407A:	Math Methods of O.R.	7	3	2	5	—	—	—	
EME417B:	Human Factors Engrg	5	—	—	—	2	1	3	
EME419B:	O.R. Managmnt Applns	5	—	—	—	2	1	3	
EME423:	Relblty & Maintnblty	11	2	1	3	2	1	3	
MEE409A:	Engineering Design	5	2	2	4	—	—	—	
MEE415A:	Fluid Mechanics	9	4	2	6	—	—	—	
MEE481B:	Engrg Experimentatn	6	—	—	—	3	1	4	
SLE4:		0	—	5	5	—	5	5	
PEE401:		—	—	2	2	—	2	2	
DRE401:		—	—	1	1	—	1	1	
Total		100	17½	21	38½	18	20½	38½	

NOTES: A. See Table 26. ECE301 must be selected in either Third or Fourth Year.

WF means Weighting Factor.

CMR PROGRAM OUTLINES

Tables 37 to 58 outline the third and fourth year programs of study available at Collège militaire royale de Saint-Jean.

Corresponding course descriptions are not included in this calendar, but may be found in the CMR calendar.

TABLE 37: Third Year — Bachelor of Science with Honours in Physics

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 341	Management: A Psychological Approach	3	—	3	—	—	—	
FLS 302	FRA-LS	(3)	—	(3)	—	—	—	(a)
FLS 312	FRA-LS	—	—	—	(3)	—	(3)	(a)
MAT 321	Differential Equations I	3	1	4	—	—	—	
MAT 322	Differential Equations II	—	—	—	3	1	4	
MAT 328	Analysis I	3	—	3	—	—	—	
MAT 411	Modern Algebra I	—	—	—	3	—	3	
PHY 311	Classical Mechanics I	3	—	3	—	—	—	
PHY 316	Mechanics of Continuous Media	—	—	—	3	—	3	
PHY 321	Electronics I	2	—	2	—	—	—	
PHY 322	Electronics II	—	—	—	2	—	2	
PHY 331	Physical Optics	3	—	3	—	—	—	
PHY 341	Statistical Physics	3	—	3	—	—	—	
PHY 361	Atomic and Nuclear Physics I	—	—	—	3	—	3	
PHY 391	Experimental Physics	—	3	3	—	—	—	
PHY 392	Experimental Physics	—	—	—	—	3	3	
PHY 421	Electrodynamics I	—	—	—	3	—	3	
SCH 326	Nuclear Strategy	—	—	—	3	—	3	(b)
Number of periods per week		20	7	27	20	7	27	

(a) For non-functional anglophone cadets.

(b) 1. The English-speaking students will take the courses in French if they have reached the functional level in the French language.

2. Those who have not attained the functional level in the second language will take the course in their mother tongue. They will also take a second language course of three periods a week.

TABLE 38: Third Year — Bachelor of Science with Major in Physics and Minor in Mathematics

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 341	Management: A Psychological Approach	3	—	3	—	—	—	
FLS 302	FRA-LS	(3)	—	(3)	—	—	—	(a)
FLS 312	FRA-LS	—	—	—	(3)	—	(3)	(a)
MAT 321	Differential Equations I	3	1	4	—	—	—	
MAT 322	Differential Equations II	—	—	—	3	1	4	
MAT 328	Analysis I	3	—	3	—	—	—	
MAT 411	Modern Algebra I	—	—	—	3	—	3	
PHY 311	Classical Mechanics I	3	—	3	—	—	—	
PHY 321	Electronics I	2	—	2	—	—	—	
PHY 322	Electronics II	—	—	—	2	—	2	
PHY 331	Physical Optics	3	—	3	—	—	—	
PHY 341	Statistical Physics	3	—	3	—	—	—	
PHY 361	Atomic and Nuclear Physics I	—	—	—	3	—	3	
PHY 391	Experimental Physics	—	3	3	—	—	—	
PHY 392	Experimental Physics	—	—	—	—	3	3	
PHY 421	Electrodynamics I	—	—	—	3	—	3	
SCH 326	Nuclear Strategy	—	—	—	3	—	3	(b)
Number of periods per week		20	7	27	17	7	24	

(a) For non-functional anglophone cadets.

(b) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Those who have not attained the functional level in the second language will take the course in their mother tongue. They will also take a second language course of three periods a week.

TABLE 39: Third Year — Bachelor of Science — Computing Science
Concentration: management

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 341	Management: A Psychological Approach	3	—	3	—	—	—	
MAT 381	Structured Programming	3	—	3	—	—	—	
INF 362	Mini-computer Systems	—	—	—	3	—	3	
INF 361	Computer Architecture and Assembler Programming	3	—	3	—	—	—	
INF 351	Computer Science in Administration	3	—	3	—	—	—	
INF 363	Structured System Analysis	—	—	—	3	—	3	
ADM 342	Operations Research I	—	—	—	3	—	3	
MAT 461	Numerical Analysis	3	—	3	—	—	—	
ADM 231	Accounting I	3	—	3	—	—	—	
*ADM 341	Applied Statistics	(3)	—	(3)	—	—	—	(a)
*SCH 313	Macroeconomic Analysis	(3)	—	(3)	—	—	—	(a)
*ADM 332	Management Accounting	—	—	—	(3)	—	(3)	(b)
*ADM 452	Public Relations and Marketing	(3)	—	(3)	—	—	—	(a)
*ADM 321	Personnel Management	—	—	—	(3)	—	(3)	(b)
*MAT 475	System Simulation	—	—	—	(3)	—	(3)	(c)
*INF 371	Teleprocessing	—	—	—	(3)	—	(3)	(c)
*PHY 482	Microprocessor System Design	—	—	—	(3)	—	(3)	(c)
FLS 302 - FLS 312		(3)	—	(3)	(3)	—	(3)	(d)
SCH 326	Nuclear Strategy	—	—	—	3	—	3	(e)
Number of periods per week		21	3	24	18	3(6)	21(24)	(f)

(a) One of these three courses must be chosen.

(b) One of these two courses must be chosen.

(c) One of these three courses must be chosen.

(d) For non-functional students.

(e) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

TABLE 39 CONT'D.

(f) Professors have a maximum of 40 periods per week available for lectures (Lect.) and laboratory work (Lab.). Unused periods can be employed for study or consultation, especially for courses requiring considerable use of computers.

*Elective course.

TABLE 40: Third Year — Bachelor of Science — Computing Science Concentration: mathematics

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 341	Management: A Psychological Approach	3	—	3	—	—	—	
MAT 381	Structured Programming	3	—	3	—	—	—	
INF 351	Computer Science in Administration	3	—	3	—	—	—	
INF 361	Computer Architecture and Assembler Programming	3	—	3	—	—	—	
INF 362	Mini-computer Systems	—	—	—	3	—	3	
MAT 328	Analysis I	3	—	3	—	—	—	
MAT 329	Analysis II	—	—	—	3	—	3	
MAT 321	Differential Equations I	4	—	4	—	—	—	
MAT 322	Differential Equations II	—	—	—	4	—	4	
MAT 461	Numerical Analysis	3	—	3	—	—	—	
MAT 312	Numerical Methods in Linear Algebra	—	—	—	3	—	3	
MAT 471	Operations Research	—	—	—	3	—	3	
*INF 363	Structured System Analysis	—	—	—	(3)	—	(3)	(a)
*MAT 351	Probability	—	—	—	(3)	—	(3)	(a)
*ADM 341	Applied Statistics	(3)	—	(3)	—	—	—	(a)
FLS 302 - FLS 312		(3)	—	(3)	(3)	—	(3)	(b)
SCH 326	Nuclear Strategy	—	—	—	3	—	3	(c)
Number of periods per week		22	3	25	22	3	25	(d)

(a) One of these courses must be chosen.

(b) Students who have not attained the functional level take this course.

(c) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(d) Professors who have a maximum of 40 periods per week available for lectures (Lect.) and laboratory work (Lab.). Unused periods can be employed for study or consultation, especially for courses requiring considerable use of computers.

*Elective course.

TABLE 41: Third Year — Bachelor of Science — Computing Science Concentration: physics

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 341	Management: A Psychological Approach	3	—	3	—	—	—	
MAT 381	Structured Programming	3	—	3	—	—	—	
INF 362	Mini-computer Systems	—	—	—	3	—	3	
PHY 381	Electronics I	2	4	6	—	—	—	
PHY 382	Electronics II	—	—	—	2	4	6	
MAT 321	Differential Equations I	4	—	4	—	—	—	
MAT 322	Differential Equations II	—	—	—	4	—	4	
INF 361	Structured System Analysis	3	—	3	—	—	—	
*PHY 311	Classical Mechanics	(3)	—	(3)	—	—	—	(a)
*PHY 341	Statistical Physics	(3)	—	(3)	—	—	—	(a)
*PHY 361	Atomic and Nuclear Physics	—	—	—	(3)	—	(3)	(b)
*PHY 316	Mechanics of Continuous Media	—	—	—	(3)	—	(3)	(b)
*PHY 421	Electrodynamics	—	—	—	(3)	—	(3)	(b)
INF 471	Computer Graphics	—	—	—	3	—	3	
MAT 461	Numerical Analysis	3	—	3	—	—	—	
PHY 334	Signal Analysis	—	—	—	3	1	4	
FLS 302 - FLS 312		(3)	—	(3)	(3)	—	(3)	(c)
SCH 326	Nuclear Strategy	—	—	—	3	—	3	(d)
Number of periods per week		21	7	28	21	8	29	(e)

(a) Students may elect one of these courses.

(b) Students may elect one of these courses.

(c) Students who have not attained the functional level take this course.

(d) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(e) Professors have a maximum of 40 periods per week available for lectures (Lect.) and laboratory work (Lab.). Unused periods can be employed for study or consultation, especially for courses requiring considerable use of computers.

*Elective course.

TABLE 42: Third Year — Bachelor of Science — Computing Science
Concentration: systems

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 341	Management: A Psychological Approach	3	—	3	—	—	—	
MAT 381	Structured Programming	3	—	3	—	—	—	
INF 362	Mini-computer Systems	—	—	—	3	—	3	
PHY 381	Electronics I	2	4	6	—	—	—	
PHY 382	Electronics II	—	—	—	2	4	6	
MAT 328	Analysis I	3	—	3	—	—	—	
MAT 329	Analysis II	—	—	—	3	—	3	
INF 361	Computer Architecture and Assembler Programming	3	—	3	—	—	—	
INF 351	Computer Science in Administration	3	—	3	—	—	—	
INF 363	Structured System Analysis	—	—	—	3	—	3	
PHY 334	Signal Analysis	—	—	—	3	1	4	
INF 371	Teleprocessing	—	—	—	3	—	3	
FLS 302 - FLS 312		(3)	—	(3)	(3)	—	(3)	(a)
SCH 326	Nuclear Strategy	—	—	—	3	—	3	(b)
Number of periods per week		17	7	24	20	8	28	(c)

(a) Students who have not attained the functional level take this course.

(b) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(c) Professors have a maximum of 40 periods per week available for lectures (Lect.) and laboratory work (Lab.). Unused periods can be employed for study or consultation, especially for courses requiring considerable use of computers.

TABLE 43: Third Year — Bachelor of Science — General (1)

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
PART A								
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 341	Management: A Psychological Approach	3	—	3	—	—	—	
FLS 302	FRA-LS	(3)	—	(3)	—	—	—	(a)
FLS 312	FRA-LS	—	—	—	(3)	—	(3)	(a)
MAT 212	Linear Algebra	(4)	—	(4)	—	—	—	(b)
MAT 251	Probability and Statistics	—	—	—	(3)	—	(3)	(b)
MAT 326	Differential Equations I	3	—	3	—	—	—	
MAT 327	Differential Equations II	—	—	—	3	—	3	
PHY 314	Intermediate Mechanics	(3)	—	(3)	3	—	3	(c)
PHY 323	Experimental Electronics	2	2	4	—	—	—	
PHY 324	Experimental Electronics	—	—	—	2	2	4	
SCH 326	Nuclear Strategy	—	—	—	3	—	3	(d)
PART B								
INF 351	Computer Science in Administration	3	—	3	—	—	—	
MLM 222	Organizational Psychology	—	—	—	3	—	3	
ADM 231	Accounting I	3	—	3	—	—	—	
ADM 332	Management Accounting	—	—	—	3	—	3	
PART C								
CHM 252	Physical Chemistry Laboratory	—	—	—	—	(3)	(3)	(b)
CHM 261	Analytical Chemistry	1	2	3	—	—	—	
CHM 321	Organic Chemistry	2	2	4	—	—	—	
CHM 322	Organic Chemistry	—	—	—	2	2	4	
CHM 341	Physical Chemistry	2	2	4	—	—	—	
CHM 342	Physical Chemistry	—	—	—	2	2	4	
Number of periods per week		A + B	14	5	19	17	5	22
		A + C	13	11	24	15	9	24

(1) A BSc (General) may be obtained by combining either parts A and B or parts A and C. With the authorization of the Faculty Council, it is also possible to get a BSc (General) by replacing, timetable permitting, one or more courses from part B or C by equivalent or more demanding courses offered by the departments of the Science division.

(a) For non-functional anglophone cadets.

(b) For Officer Cadets who have not taken this course in Second Year.

(c) May be given either term to optimize the student's workload.

TABLE 43 CONT'D.

(d) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Those who have not attained the functional level in the second language will take the course in their mother tongue. They will also take a second language course of three periods a week.

TABLE 44: Third Year — Administration

Courses		Periods per week		Notes
		First Term	Second Term	
Physical Education		2	2	
Drill		1	1	
FLS 302	FRA-LS	(3)	—	(a)
FLS 312	FRA-LS	—	(3)	(a)
MLM 222	Organizational Psychology	—	3	
ADM 321	Personnel Management	3	(3)	(b)
ADM 323	Commercial & Fiscal Law	(3)	3	(b)
ADM 324	Public Administration	(3)	—	(d)
ADM 331	Finance	3	—	
ADM 332	Management Accounting	—	3	
ADM 341	Applied Statistics	3	—	
ADM 342	Operations Research I	—	3	
ADM 343	Research Methodology	(3)	—	(d)
SCH 311	Economic History in a Social Context	(3)	—	(c)
SCH 312	Canadian Economic History	—	(3)	(d)
SCH 313	Macroeconomic Analysis	3	—	
SCH 326	Nuclear Strategy	—	3	(e)
INF 351	Computer Science in Administration	(3)	—	(c)
MAT 475	System simulation	—	(3)	(d)
Seminars, Symposia and Industrial Visits		3	3	
Number of periods per week		24	24	

(a) For non-functional anglophone cadets.

(b) May be given either term to optimize the student's workload.

(c) Students may elect SCH 311 or INF 351 (Elective courses).

(d) Students must elect 2 of SCH 312, ADM 324, MAT 475 and ADM 343 (Elective courses). (N.B.: SCH 311 is a prerequisite for SCH 312).

(e) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Those who have not attained the functional level in the second language will take the course in their mother tongue. They will also take a second language course of three periods a week.

TABLE 45: Third Year — B.A. (Canadian Studies and Administration)

Courses		Periods per week		Notes
		First Term	Second Term	
Physical Education		2	2	
Drill		1	1	
FLS 302	FRA-LS	(3)	—	(a)
FLS 312	FRA-LS	—	(3)	(a)
ADM 321	Personnel Management	3	(3)	(b)
ADM 323	Commercial and Fiscal Law	3	(3)	(b)
ADM 331	Finance	3	—	
ADM 463	Industrial Relations	—	3	
ENG 301	Canadian Literature in English I	(3)	—	(c)
ENG 302	Canadian Literature in English II	—	(3)	(c)
FRA 301	Littérature québécoise I	3	—	(c)
FRA 302	Littérature québécoise II	—	3	(c)
SCH 232	Military History of Canada I	—	3	
SCH 254	Canadian Society	—	(3)	(c)
SCH 311	Economic History in a Social Context	3	—	
SCH 312	Canadian Economic History	—	3	
SCH 326	Nuclear Strategy	—	3	(d)
SCH 452	Canadian Civilization	—	3	(e)
One elective course		—	3	(f)
Seminars, visits & meetings		3	3	
Number of periods per week		24	27	

(a) For non-functional anglophone cadets.

(b) May be given either term to optimize the student's workload.

(c) This course will be offered in 1980-81, in 1982-83, etc., and thus alternate every two years.

(d) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

TABLE 45 CONT'D.

2. Those who have not attained the functional level in the second language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(e) This course will be offered in 1979-80, in 1981-82, etc., and thus alternate every two years.

(f) ADM 232; Accounting II; ADM 324; Public Administration.

TABLE 46: Third Year — B.A. (Military and Strategic Studies)

Courses		Periods per week		Notes
		First Term	Second Term	
Physical Education		2	2	
Drill		1	1	
MLM 341	Management: A Psychological Approach	3	—	
SCH 360	International Relations I	3	—	
SCH 316	Classical Strategy	3	—	
SCH 318	Soviet Defence Policy	—	3	
SCH 326	Nuclear Strategy	—	3	
LIT 340	Canadian Literature and Military Experience	—	3	
FLS 302		(3)	—	(a)
FLS 312		—	(3)	(a)
Two elective courses		6	—	(b)
Two elective courses		—	6	(b)
Number of periods per week		18	18	

(a) For non-functional anglophone students.

(b) 1. First term:
ADM 323 Introduction to Law
FRA 310 Guerre et Littérature (Not offered in 1981-1982).
MAT 335 Introduction to Game Theory — prerequisite for MAT 476.
SCH 217 Defence Economics.
SCH 311 Economic History in a Social Context — prerequisite for SCH 312.
SCH 313 Macroeconomic Analysis.

2. Second term:
ADM 321 Personnel Management
ADM 324 Public Administration — prerequisite for ADM 413.
ADM 332 Management Accounting — ADM 231 prerequisite.
ENG 310 Military Readings (Not offered in 1981-1982).
PHY/CHM 399 Technology of Weapons.
SCH 312 Canadian Economic History — SCH 311 prerequisite.
SCH 319 Great Battles.
SCH 350 Security Problems in the Third World.

3. Timetable and Personnel permitting.

TABLE 47: Third Year — B.A. with Honours in Military and Strategic Studies

Courses		Periods per week		Notes
		First Term	Second Term	
Physical Education		2	2	
Drill		1	1	
MAT 335	Game Theory	3	—	
MLM 341	Management: A Psychological Approach	3	—	
SCH 360	International Relations I	3	—	
SCH 317	Defence Economics	3	—	
SCH 316	Classical Strategy	3	—	
ADM 323	Introduction to Law	3	—	
SCH 318	Soviet Defence Policy	—	3	
SCH 350	Third World	—	3	
SCH 326	Nuclear Strategy	—	3	
PHY/CHM 399	Technology of Weapons	—	3	
SCH 319	Great Battles	—	3	
LIT 340	Canadian Literature and Military Experience	—	3	
FLS 302		(3)	—	(a)
FLS 312		—	(3)	(a)
Number of periods per week		21	21	

(a) For non-functional anglophone students.

TABLE 48: Fourth Year — Bachelor of Science with Honours in Physics

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 422	Behaviour in Military Setting	—	—	—	3	—	3	(a)
FLS 402		(3)	—	(3)	—	—	—	(b)
FLS 412		—	—	—	(3)	—	(3)	(b)
MAT 325	Complex Variables	3	—	3	—	—	—	
MAT 329	Analysis II	—	—	—	3	—	3	
MAT 412	Modern Algebra II	—	—	—	3	—	3	
MAT 421	Methods of Mathematical Physics I	3	—	3	—	—	—	
MAT 422	Methods of Mathematical Physics II	—	—	—	3	—	3	
MAT 475	System Simulation	—	—	—	(3)	—	(3)	(c)
PHY 312	Classical Mechanics II	3	—	3	—	—	—	
PHY 316	Mechanics of Continuous Media	—	—	—	(3)	—	(3)	(d)
PHY 362	Atomic and Nuclear Physics II	3	—	3	—	—	—	
PHY 422	Electrodynamics II	—	—	—	3	—	3	
PHY 427	Microprocessor System Design	—	—	—	(3)	—	(3)	(e)
PHY 451	Quantum Mechanics	—	—	—	3	—	3	
PHY 471	Solid State Physics	3	—	3	—	—	—	
PHY 472	Solid State Physics	—	—	—	3	—	3	
PHY 491	Experimental Physics	—	6	6	—	—	—	
PHY 492	Experimental Physics	—	—	—	—	6	6	
Seminars		—	1	1	—	1	1	
Number of periods per week		18	10	28	18	10	28	

(a) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(b) For non-functional anglophone cadets.

TABLE 48 CONT'D.

(c) Optional.

(d) Compulsory for students who have not taken this course in the preceding year.

(e) Optional - PHY 426 is a prerequisite for PHY 427.

TABLE 49: Fourth Year — Bachelor of Science with Major in Physics and Minor in Mathematics (1)

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Training		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 422	Behaviour in Military Setting	—	—	—	3	—	3	(a)
FLS 402		(3)	—	(3)	—	—	—	(b)
FLS 412		—	—	—	(3)	—	(3)	(b)
MAT 325	Complex Variables	3	—	3	—	—	—	
MAT 330	Methods of Optimization	—	—	—	3	—	3	
MAT 461	Numerical Analysis	3	—	3	—	—	—	
MAT 471	Operations Research	—	—	—	3	—	3	
MAT 475	System Simulation	—	—	—	3	—	3	
PHY 362	Atomic and Nuclear Physics II	3	—	3	—	—	—	
PHY 426	Logic Circuit Design	3	—	3	—	—	—	
PHY 427	Microprocessor System Design	—	—	—	(3)	—	(3)	(c)
PHY 471	Solid State Physics	3	—	3	—	—	—	
PHY 491	Experimental Physics	—	6	6	—	—	—	
PHY 492	Experimental Physics	—	—	—	—	6	6	
Seminars		—	1	1	—	1	1	
Number of periods per week		15	10	25	12	10	22	

(1) With the authorization of the Faculty Council, timetable permitting, students may replace some Physics and/or Mathematics courses from this program by other courses in Physics and/or Mathematics taken from the Honours in Physics program.

(a) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(b) For non-functional anglophone students.

(c) Optional — PHY 426 is a prerequisite for PHY 427.

TABLE 50: Fourth Year — Bachelor of Science — Computing Science
Concentration: management

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 422	Behaviour in a Military Setting	—	—	—	3	—	3	(a)
PHY 481	Logic Circuit Design	3	3	6	—	—	—	
INF 443	DBMS	—	—	—	3	—	3	
INF 461	Operating Systems	3	—	3	—	—	—	
ADM 450	Information Systems Analysis	—	—	—	3	—	3	
INF 442	Data and File Structures	3	—	3	—	—	—	
ADM 414	Operations Management	—	—	—	3	—	3	
ADM 331	Finance	3	—	3	—	—	—	
*ADM 441	Operations Research II	(3)	—	(3)	—	—	—	(b)
*SCH 412	Managerial Economics	(3)	—	(3)	—	—	—	(b)
*ADM 232	Accounting II	—	—	—	(3)	—	(3)	(c)
*ADM 412	Business Policy	—	—	—	(3)	—	(3)	(c)
INF 471	Computer Graphics	—	—	—	3	—	3	
ADM 493	Project	—	—	—	—	3	3	
FLS 402 -FLS 412		(3)	—	(3)	(3)	—	(3)	(d)
Number of periods per week		15	6	21	18	6	24	(e)

(a) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(b) One of these two courses must be chosen.

(c) One of these two courses must be chosen.

(d) For non-functional students.

(e) Professors have a maximum of 40 periods per week available for lectures (Lect.) and laboratory work (Lab.). Unused periods can be employed for study or consultation, especially for courses requiring considerable use of computers.

*Elective course.

TABLE 51: Fourth Year — Bachelor of Science — Computing Science
Concentration: mathematics

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 422	Behaviour in a Military Setting	—	—	—	3	—	3	(a)
INF 461	Operating Systems	3	—	3	—	—	—	
INF 442	Data and File Structures	3	—	3	—	—	—	
MAT 413	Introduction to Applied Algebra	3	—	3	—	—	—	
MAT 421	Methods of Applied Mathematics	3	—	3	—	—	—	
PHY 481	Microprocessor System Design	3	3	6	—	—	—	
MAT 329	Analysis II	3	—	3	—	—	—	(1)
MAT 423	Introduction to the Num Solution of Ord & Part Diff Equa	—	—	—	3	—	3	
MAT 475	System Simulation	—	—	—	3	—	3	
*MAT 330	Methods of Optimization	—	—	—	(3)	—	(3)	(b)
*ADM 441	Operations Research II	(3)	—	(3)	—	—	—	(b)
*MAT 463	Discrete Mathematical Structures	—	—	—	(3)	—	(3)	(b)
*INF 471	Computer Graphics	—	—	—	(3)	—	(3)	(b)
MAT 493	Project	—	—	—	—	3	3	
FLS 402 - FLS 412		(3)	—	(3)	(3)	—	(3)	(c)
*INF 371	Teleprocessing	—	—	—	(3)	—	(3)	(b)
*ADM 341	Applied Statistics	(3)	—	(3)	—	—	—	(b)
Number of periods per week		22	3	25	22	3	25	(d)

(a) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(b) Two courses, not previously taken, must be chosen from this group.

(c) Students who have not attained the functional level take this course.

TABLE 51 CONT'D.

(d) Professors have a maximum of 40 periods per week available for lectures (Lect.) and laboratory work (Lab.). Unused periods can be employed for study or consultation, especially for courses requiring considerable use of computers.

(1) Given in 82-83 only.

*Elective course.

TABLE 52: Fourth Year — Bachelor of Science — Computing Science
Concentration: physics

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 422	Behaviour in a Military Setting	—	—	—	3	—	3	(a)
PHY 481	Logic Circuit Design	3	3	6	—	—	—	
PHY 482	Microprocessor System Design	—	—	—	3	3	6	
INF 461	Operating Systems	3	—	3	—	—	—	
MAT 328	Analysis I	3	—	3	—	—	—	
MAT 475	System Simulation	—	—	—	3	—	3	
*PHY 471	Solid State Physics	(3)	—	(3)	—	—	—	(b)
*PHY 331	Physical Optics	(3)	(1)	(4)	—	—	—	(b)
INF 371	Teleprocessing	—	—	—	3	—	3	
*PHY 361	Atomic and Nuclear Physics	—	—	—	(3)	—	(3)	(c)
*PHY 316	Mechanics of Continuous Media	—	—	—	(3)	—	(3)	(c)
*PHY 421	Electrodynamics	—	—	—	(3)	—	(3)	(c)
INF 442	Data and File Structures	3	—	3	—	—	—	
PHY 493	Project	—	—	—	—	3	3	
FLS 402 - FLS 412		(3)	—	(3)	(3)	—	(3)	(d)
Number of periods per week		15	6(7)	21(22)	15	9	24	(e)

(a) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(b) Students may elect one of these courses.

(c) One course, not previously taken, must be chosen from these three.

(d) Students who have not attained the functional level take this course.

(e) Professors have a maximum of 40 periods per week available for lectures (Lect.) and laboratory work (Lab.). Unused periods can be employed for study or consultation, especially for courses requiring considerable use of computers.

*Elective course.

TABLE 53: Fourth Year — Bachelor of Science — Computing Science
Concentration: systems

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 422	Behaviour in a Military Setting	—	—	—	3	—	3	(a)
PHY 482	Microprocessor System Design	—	—	—	3	3	6	
PHY 481	Logic Circuit Design	3	3	6	—	—	—	
INF 471	Computer Graphics	—	—	—	3	—	3	
INF 461	Operating Systems	3	—	3	—	—	—	
INF 441	Compiler	—	—	—	3	—	3	
INF 442	Data and File Structures	3	—	3	—	—	—	
INF 443	DBMS	—	—	—	3	—	3	
MAT 329	Analysis II	3	—	3	—	—	—	(1)
MAT 413	Introduction to Applied Algebra	3	—	3	—	—	—	
MAT 461	Numerical Analysis	3	—	3	—	—	—	
MAT 321	Differential Equations I	4	—	4	—	—	—	
*MAT 322	Differential Equations II	—	—	—	(4)	—	(4)	(b)
*MAT 475	System Simulation	—	—	—	(3)	—	(3)	(b)
INF 493	Project	—	—	—	—	3	3	
FLS 402 - FLS 412		(3)	—	(3)	(3)	—	(3)	(c)
Number of periods per week		22	6	28	18(19)	9	27(28)	(d)

(a) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(b) Students must take one of these two courses.

(c) Students who have not attained the functional level take this course.

(d) Professors have a maximum of 40 periods per week available for lectures (Lect.) and laboratory work (Lab.). Unused periods can be employed for study or consultation, especially for courses requiring considerable use of computers.

(1) Given in 82-83 only.

*Elective courses.

TABLE 54: Fourth Year — Bachelor of Science — General (1)

Courses		Periods per week						Notes
		First Term			Second Term			
		Lect.	Lab.	Total	Lect.	Lab.	Total	
PART A								
Physical Education		—	2	2	—	2	2	
Drill		—	1	1	—	1	1	
MLM 422	Behaviour in Military Setting	—	—	—	3	—	3	(a)
FLS 402		(3)	—	(3)	—	—	—	(b)
FLS 412		—	—	—	(3)	—	(3)	(b)
MAT 351	Probability	—	—	—	3	—	3	
MAT 381	Structured Programming	3	—	3	—	—	—	
MAT 461	Numerical Analysis	3	—	3	—	—	—	
MAT 471	Operations Research	—	—	—	3	—	3	
PHY 314	Intermediate Mechanics	(3)	—	(3)	—	—	—	(c)
PHY 331	Physical Optics	3	—	3	—	—	—	
PHY 423	Electromagnetic Waves	—	—	—	(3)	—	(3)	(d)
PHY 491	Experimental Physics	—	6	6	—	—	—	
PHY 492	Experimental Physics	—	—	—	—	6	6	
Seminars		—	1	1	—	1	1	
PART B								
ADM 311	Organization Theory and Practice	3	—	3	—	—	—	
ADM 331	Finance	3	—	3	—	—	—	
ADM 450	Information Systems Analysis	—	—	—	3	—	3	
ADM 463	Industrial Relations	—	—	—	3	—	3	
PART C								
CHM 421	Organic Chemistry	2	2	4	—	—	—	
CHM 422	Organic Chemistry	—	—	—	2	2	4	
CHM 441	Physical Chemistry	2	2	4	—	—	—	

TABLE 54 CONT'D.

CHM 442	Physical Chemistry		—	—	—	2	2	4
Number of periods per week		A + B	15	10	25	15	10	25
		A + C	13	14	27	13	14	27

(1) A BSc (General) may be obtained by combining either parts A and B or parts A and C. With the authorization of the Faculty Council, it is also possible to get a BSc (General) by replacing, timetable permitting, one or more courses from part B or C by equivalent or more demanding courses offered by the departments of the Science division.

(a) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(b) For non-functional anglophone cadets.

(c) For students who have not taken this course in Third Year.

(d) Optional.

TABLE 55: Fourth Year — Administration

Courses		Periods per week		Notes
		First Term	Second Term	
Physical Education		2	2	
Drill		1	1	
MLM 412	Job Adjustment and Personality	—	(3)	(a)
MLM 422	Behaviour in Military Setting	—	3	(b)
FLS 402		(3)	—	(c)
FLS 412		—	(3)	(c)
ADM 311	Organizational Development	3	—	
ADM 412	Business Policy	—	3	
ADM 413	Management Control in Non-profit Organizations	(1½)	(1½)	(d)
ADM 414	Operations Management	—	3	
ADM 431	Operational Auditing	(3)	—	(e)
ADM 441	Operations Research II	(3)	—	(e)
ADM 450	Information Systems Analysis	—	3	
ADM 452	Marketing	3	—	
ADM 460	Project in Administration	(1½)	(1½)	(d)
ADM 463	Industrial Relations	—	3	
SCH 412	Managerial Economics	3	—	
SCH 421	International Relations II	3	—	
Seminars, Symposia & Industrial Visits		3	3	
Number of periods per week		22½	22½	

(a) Optional course.

(b) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

TABLE 55 CONT'D.

(c) For non-functional anglophone students.

(d) Students may elect ADM 413 or ADM 460 (Elective courses).

(e) Students may elect ADM 431 or ADM 441 (Elective courses).

TABLE 56: Fourth Year — B.A. (Canadian Studies and Administration)

Courses		Periods per week		Notes
		First Term	Second Term	
Physical Education		2	2	
Drill		1	1	
MLM 422	Behaviour in Military Setting	—	3	(a)
FLS 402		(3)	—	(b)
FLS 412		—	(3)	(b)
SCH 232	Military History of Canada	—	3	
SCH 254	Canadian Society	—	(3)	(c)
SCH 411	Geopolitics and Geostrategy	3	—	
SCH 421	International Relations II	3	—	
SCH 424	The Canadian Identity	—	3	
SCH 452	Canadian Civilization	—	3	(d)
FRA 401	Littérature québécoise	3	—	(d) (1)
FRA 402	Littérature québécoise	—	3	(d) (2)
ENG 401	Canadian Literature in English III	3	—	(d) (1)
ENG 402	Canadian Literature in English IV	—	3	(d) (2)
CMR 401	Essay	3	3	(e)
ADM 452	Marketing	3	—	
Seminars, Visits & Meetings		3	3	
Number of periods per week		24	27	

(a) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(b) For non-functional anglophone cadets.

(c) This course will be offered in 1980-81, in 1982-83, etc., to those who have not already taken it in Second or Third Year.

(d) This course will be offered in 1979-80, in 1981-82, etc., and thus alternate every two years.

TABLE 56 CONT'D.

(e) This Essay will be 50 pages minimum in length and must be approved by a teaching member of Canadian Studies and Administration Program. It will be written under his supervision and in accordance with an approved schedule of work.

(1) Replaced by 3rd Year courses: ENG 301 and FRA 301.

(2) Replaced by 3rd Year courses: ENG 302 and FRA 302.

TABLE 57: Fourth Year — B.A. (Military and Strategic Studies) (1)

Courses		Periods per week		Notes
		First Term	Second Term	
Physical Education		2	2	
Drill		1	1	
SCH 415	Canadian Defence Policy	3	—	
SCH 428	American Defence Policy	3	—	
SCH 417	Strategic Resources	3	—	
MLM 422	Behaviour in Military Setting	—	3	(a)
SCH 419	Current Events	—	3	
SCH 440	Arms Control	—	3	
FLS 402		(3)	—	(b)
FLS 412		—	(3)	(b)
Two elective courses		6	—	(c)
Two elective courses		—	6	(c)
Number of periods per week		18	18	

(a) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(b) For non-functional anglophone students.

(c) 1. First term:
ADM 411 Decision Making.
ADM 413 Management Control in Non-Profit Organization — ADM 324 prerequisite.
ADM 425 War and the Law.
ENG 405 Great Books of the Western World (Not offered in 1981-1982).
MLM 415 Sociology of War.

2. Second term:
ADM 463 Industrial Relations
FRA 410 Les Idées du XX^{e} siècle (Not offered in 1981-82).
MAT 476 War Games — MAT 335 prerequisite.
MLM 412 Job Adjustment and Personality.
SCH 426 Comparative Defence Policy.

3. Timetable and Personnel permitting.

TABLE 58: Fourth Year — B.A. with Honours in Military and Strategic Studies (1)

Courses		Periods per week		Notes
		First Term	Second Term	
Physical Education		2	2	
Drill		1	1	
MLM 415	Sociology of War	3	—	
SCH 415	Canadian Defence Policy	3	—	
SCH 428	American Defence Policy	3	—	
SCH 417	Strategic Resources	3	—	
ADM 425	War and Law	3	—	
ADM 411	Decision Making	3	—	
CMR 402	Essay	3	3	
MAT 476	War Games	—	3	
MLM 422	Behaviour in Military Setting	—	3	(a)
SCH 426	Comparative Defence Policies	—	3	
SCH 419	Current Events	—	3	
SCH 440	Arms Control	—	3	
FLS 402		(3)	—	(b)
FLS 412		—	(3)	(b)
Number of periods per week		24	21	

(a) 1. The English-speaking students will take the course in French if they have reached the functional level in the French language.

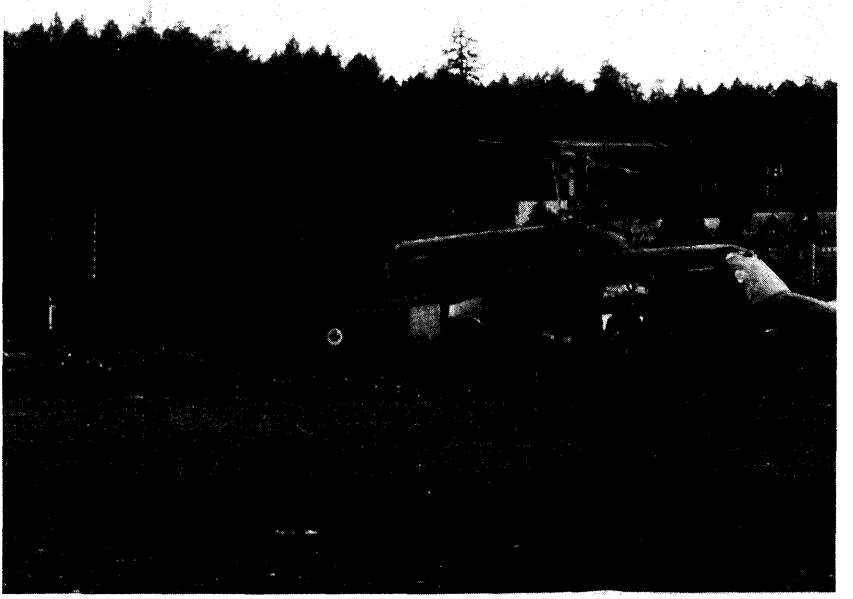
2. Anglophones who have not attained the functional level in the French language will take the course in their mother tongue. They will also take a second language course of three periods a week.

(b) For non-functional anglophone students.

MILITARY TRAINING

SEA

LAND



AIR

COURSE DESCRIPTIONS

The different courses offered at RRMC are described in detail in the sections that follow (listed alphabetically by departments). For each course at RRMC the name of the subject (e.g. History) is given, followed by a three digit number prefixed by the letters RR. The RR designates that the course is offered at Royal Roads Military College; the first number indicates the year in which the course is normally taken, the second number is used to distinguish between the various courses offered by the department in that year, and the third number indicates the semester in which the course is offered. Some courses at RRMC extend over a full academic year of two semesters; these courses will be indicated by a 3 as the third number (e.g. Mathematics RR203). The course number is followed by a brief descriptive title of the course; this in turn is followed by four numbers in parentheses that indicate respectively the number of lectures, tutorials, and laboratory periods each week in each semester, and the number of units of credit assigned to the course each semester. A detailed course description would read as follows:

PHYSICS RR101: Mechanics **(4,2,3,5/-,-,-,-)**

This is a one semester course in mechanics offered by the Department of Physics in the first semester in the first year. The course meets four times each week for lectures, twice for tutorials, three times for laboratory periods, and carries five units of credit.

MATHEMATICS RR203: Calculus, Linear Algebra, Probability and Statistics, Operations Research **(3,2,0,4/3,2,0,4)**

This is a year course in modern algebra offered by the Department of Mathematics in the second year. The course extends over both the first and second semesters of the year, meets three times each week for lectures, twice for tutorials, has no laboratory periods, and carries eight units of credit for the year (four units each semester).

Note 1: In a few cases, a student may take only one semester of a two semester course. In this case his transcript will indicate a course numbering ending in a 1 or 2, instead of the usual 3 (e.g. History RR111 is the first semester of the History RR113 course).

DEPARTMENT OF CHEMISTRY

Associate Professor and Head of the Department — M.R. Barr, BSc, MSc, PhD, MCIC

Associate Professor — M.G. Robinson, BSc, PhD, MCIC

Assistant Professor — G.M. Barrow, BASc, MASc, PhD

Assistant Professor — K.J. Reimer, BSc, MSc, PhD, MCIC

Special Lecturer — Major S.E. Lipin, CD, rmc, BEng, MSc

PHYSICAL SCIENCE COURSES

A four-semester sequence of courses in Physical Science is offered for cadets entering the Arts program of study. Two semesters are devoted to topics in chemistry and two to topics in physics. The order of presentation of the courses is as follows:

a. First year — Chemistry RR123;

b. Second year — Physics RR123.

Details of the course in physics will be found in that section of the calendar under the heading Physics RR123.

CHEMISTRY RR123: Introductory Chemistry (3,0,3,4/3,0,3,4)

This course surveys the development of modern chemical science with an emphasis on the application of the scientific method. The concept of atoms and atomic structure will be considered as will the nature of chemical bonds and the relation of chemical properties to the periodic table. Topics such as redox reactions, solubility, acids and bases, equilibrium, and radio-activity will be covered; the emphasis being on the application of these principles to an understanding of the world in terms of molecular behaviour. Examples will include polymers, explosives, war gases, corrosion, chemotherapy, water purification, energy options. Laboratory experiments will illustrate and supplement the lecture material.

CHEMISTRY RR103: General Chemistry (3,0,3,4/3,0,3,4)

Review of fundamental laws. The properties of gases; elementary kinetic theory, Atomic structure, the Periodic Law. Types of valence bond; molecular structure. Redox processes; balancing of redox equations; electrolytic and voltaic cells. The properties of solutions. Rates of chemical reactions. Chemical equilibrium; ionic equilibria; pH, hydrolysis, and buffers. A brief introduction to organic chemistry.

The laboratory course is intended to supplement the lectures. Quantitative determinations include gravimetric methods and neutralization, precipitation, and redox volumetric methods. Qualitative analysis covers the identification and determination of most common inorganic anions and cations. A final organic section deals with the synthesis and properties of the common functional groups.

CHEMISTRY RR201: Engineering Chemistry **(4,1,0,4/-,-,-,-,)**

A course intended for cadets electing Engineering, Honours Science, or Engineering Physics program in the third year.

The course is divided into two parts:

(a) Review of the Gas Laws — Elementary thermodynamics — discussion of the first, second and third laws — reversible and irreversible processes — spontaneity of reactions involving gases and different types of heterogeneous systems. Electrode potentials, cells, free energy, chemical potential, one and two phase systems, the phase rule; and, as time allows;

(b) Applications of chemistry of interest specifically to engineers, drawn from such topics as gaseous, liquid, and solid fuels, lubricants, corrosion, cells, batteries, plastics, protective coatings, explosives, etc.

CHEMISTRY RR212: Engineering and Physical Chemistry **(-,-,-,-/4,1,3,5)**

This course is taken by those students who have elected the General Science program.

The lecture section of this course is essentially the same as that described under Chemistry RR201.

However, cadets taking this program are required to accompany the lectures by an appropriate laboratory practice.

Selected fundamental experiments in physical chemistry will be allocated, illustrating such aspects of the coursework as phase rule, electrode potential, heats of reaction, distillation, etc.

CHEMISTRY RR242: Engineering Chemistry Laboratory **(-,-,-,-/0,0,3,1)**

This course is identical to the laboratory part of Chemistry RR212 and is required of students in Honours Science and of those students in General Science who have successfully completed Chemistry RR201 in the first semester.

CHEMISTRY RR301: Analytical Methods **(2,0,4,4/-,-,-,-)**

The object of this course is to introduce students to analytical procedures and data analysis.

Lectures will deal with the theory underlying classical and modern analytical methods. These include volumetric, gravimetric and complexometric procedures; spectrophotometric, electroanalytical and chromatographic methods.

Laboratory work will be divided into two parts. Redox, precipitation and EDTA titrations will be utilized to develop manipulative skill. Considerable emphasis will be placed on time-budgeting and dove-tailing of experiments. The second part of the lab will focus on instrumental methods including polarography; VIS, UV and infrared spectroscopy; chromatography. Several of the instruments will be interfaced with a micro-

processor. Emphasis will be on the exploitation of this interface for optimum instrumental application and data analysis. These experiments will be applied to "real" problems such as polutants in marine samples (water and fish), naval boiler contamination, etc.

OCEANOGRAPHY RR322: Biological Oceanography **(-,-,-,-/2,0,1,3)**

Introduction to phytoplankton and zooplankton — classification, populations, occurrence, and distribution. Primary productivity and limiting factors, nutrients and light. Food chains and biogeochemical cycles. Potential of the oceans as a source of food. Acoustic deep scattering layers.

OCEANOGRAPHY RR332: Chemical Oceanography **(-,-,-,-/3,0,2,4)**

Chemical composition and properties of sea water. Geochemical cycles, carbonate silicon, etc. Dissolved and suspended organic material. Dissolved gases, pH and alkalinity. Nutrients. Trace metals and sediments. Corrosion and fouling. Commercial extraction of chemicals from the ocean.

In the laboratory program an attempt is made to duplicate the collection of samples in an actual oceanographic study. Students collect samples from stations in nearby marine areas on a routine basis and analyse them using current analytical methods. The anlyses cover both Oceanography RR322 and Oceanography RR332. The data are interpreted in terms of the seasonal changes in the chemistry and biology of a marine ecosystem.

CHEMISTRY RR401: Applied Thermodynamics **(3,0,0,4/-,-,-,-)**

Review of the laws of thermodynamics and applications of fundamental relationships. Heat engines; study of types and thermodynamics of operation, gas liquification and refrigeration systems; non-ideal substances and the use of steam tables; thermodynamics of flow processes for compressible and incompressible fluids. Methods of presenting thermodynamic data. Psychrometry and the application of thermodynamics to meteorology.

Note: Details of individual courses offered at RMC and CMR should be obtained from their respective calendars.

DEPARTMENT OF ENGINEERING

Associate Professor and Head of the Department — E.R. Chappell, rmc, BSc, MA Sc, MEIC, MCSCE, MCASI, PEng.

Associate Professor — J.W. Madill, BSc (CE), MSc (CE) EdD, MEIC, MCGS, MCSE, PEng.

Assistant Professor — J.S. Collins, BSc, BEng (EE), MEng (EE) PhD (EE), MCSEE, MEIC, MIEEE, PEng.

COMPUTER SCIENCE RR201: Computer Applications **(2,0,2,3/-,-,-,-)**

For second year Science or Engineering students.

This course is intended to develop the student's ability to use the computer for practical problem solving. The students will write their own programs as well as use library programs. Proper documentation, critical examination and interpretation of program results will be emphasized.

Topics covered include number and data representation, computational pitfalls, numerical integration, modelling of measured data by curve fitting, simulation of dynamic systems and solution of linear simultaneous equations.

Selected applications from engineering, physics, and chemistry will be used to illustrate the use of the computer.

ENGINEERING RR261: Engineering Graphics **(2,0,1,2/-,-,-,-)**

For second year General and Honours Science students.

Use of drawing instruments and drawing materials; geometric constructions; lettering; sketching and shape description; multiview projection; reading drawings; sectional views; auxiliary views; dimensioning; oblique and isometric pictorial sketching.

ENGINEERING RR263: Engineering Graphics and Descriptive Geometry **(2,0,1,2/3,0,1,4)**

For second year Engineering students.

Includes all topics covered in Engineering RR261 and the following additional topics.

Point projection of lines, normal views of planes, cuts and fills, revolutions, developments, graphical solution of vectors, simple determinate truss analysis, graphical calculus, determination of areas, centroids and moments of inertia, empirical equations.

Perspective drawing, auxiliary views, conventions, screw threads and an introduction to creative design where cadet teams provide design solutions to given problems.

Practical problems are used throughout the course.

ENGINEERING RR232: Mechanics of Materials **(-,-,-,-/3,0,2,4)**

For second year Engineering and Honours Science students; recommended for those intending to enter the Physics and Oceanography program; optional for General Science.

Review of statics; stresses due to axial loads, strain and axial deformation; stress due to temperature change; physical properties of materials, torsion of circular shafts and thin walled tubes; analysis of plane stress, stresses in beams due to bending, combined stresses. The elastic properties are emphasized throughout.

The Mechanics of Materials laboratory gives the student an opportunity to carry out: tensile tests on a number of different metal samples; Rockwell Hardness tests; and torsion tests to failure. There will be demonstrations of strain distribution in a beam due to bending; the behaviour of a strut under axial compression; and photoelasticity to help illustrate the subject matter.

ENGINEERING RR312: Applied Fluid Mechanics **(-,-,-,-/4,0,2,5)**

For third year Science students.

Newtonian and non-Newtonian fluid properties, fluid pressure, ship stability, free surfaces and manometry; fundamental equations for steady one-dimensional, non-viscous incompressible flow; dimensional analysis and principles of similarity and modelling; laminar flow, turbulent flow, boundary layer, skin friction, and drag estimation; incompressible flow in closed circuits and open channels; Mach number, cavitation and selected topics.

The laboratory course amplifies topics discussed in the lectures. Experiments include ship stability, jet impact, flow measurements, boundary layer flows, pipe system friction losses and demonstrations of flow phenomena.

COMPUTER SCIENCE RR332: Organization of Programming Languages **(-,-,-,-/3,0,1,4)**

Language definition; data types and structures; control structures; run-time considerations. Comparison of the structure of several high-level languages both compiled and interpreted.

Prerequisite: CS RR301.

COMPUTER SCIENCE RR412: Operating Systems **(-,-,-,-/3,0,1,4)**

Computer architecture; dynamic procedure activation; system structure and evaluation; memory and process management; recovery procedures; microprogramming.

Prerequisite: CS RR301.

Note: Details of individual courses offered at RMC or CMR should be obtained from their respective calendars.

DEPARTMENT OF ENGLISH AND PHILOSOPHY

Professor and Head of Department — G.A. Morgan, BA, MA (Phil), MA (Lit), PhD, MNI, CMMC.

Assistant Professor — M. Madoff, AB, PhD.

Special Lecturer — Major G.W.S. Brodsky, CD, BA, MA.

ENGLISH RR003 **(3,1,0,3/3,1,0,3)**

For first year Science and Engineering students considered weak in English grammar and composition.

Part I: Composition, Logic and Linguistics; study of major authors from Chaucer to Shakespeare (First Semester)

This part of the course includes review and practice of the principles of clear and accurate expression, through an introduction to traditional formal logic and to the history and structure of English, with frequent composition assignments drawn from these studies. Tutorials will be devoted to guided practice in composition. Study of selected works by major authors from Chaucer to Shakespeare will provide subjects for oral and written composition.

Three essays and frequent short assignments are required from each cadet.

Part II: Utopian Literature (Second Semester)

In this part of the course, the student analyzes various literary forms of social criticism and examines the effect of ideas of social organization on the individual citizen. Students examine Utopian thought as expressed in six or seven works, by authors ranging from Plato to Burgess. Tutorials will be devoted to continued composition practice, including frequent short assignments and preparation and revision of major essays.

Three essays and frequent short assignments are required from each cadet.

ENGLISH RR103 **(3,1,0,4/3,1,0,4)**

For first year Science and Engineering students.

Part I: Logic and Linguistics; Survey of English Literature from Chaucer to Marlowe (Fall Semester)

This part of the course includes a review of the principles of clear and accurate expression with a study of major authors from Chaucer to Marlowe.

Three essays are required from each cadet, one of which will be an oral report.

Part II: Utopian Literature (Spring Semester)

In this part of the course, the student analyzes various literary forms of social criticism and examines the effect of ideas of social organization on the individual citizen. Beginning with Plato, More and Bacon, the student proceeds to other examples of

Utopian thought, including the satire of Swift and several modern anti-Utopias (e.g. Zamiatin, Burgess).

Three essays are required from each cadet.

ENGLISH RR113: English Literature 1100-1950 **(3,0,0,4/3,0,0,4)**

Study of important literary works by major authors from the age of medieval artists (chiefly Geoffrey Chaucer) to the Baroque occupies the first semester. Readings include medieval lyrics and ballads, selections from Chaucer's *Canterbury Tales,* mystery and morality plays, Malory's *Morte d'Arthur,* the drama of Marlowe and Shakespeare, and the poetry of Donne (the "Metaphysicals") and of Milton.

In the second semester, important literary works by major authors from the Augustan Age to the mid-twentieth century will be studied. Readings include the satires of Pope and Swift, essays of Gibbon and Burke, poetry by Blake and the Romantics, Victorian fiction and poetry, the novels of Conrad and Joyce, and modern poetry.

Students are required to write essays, shorter compositions, and a final examination.

ENGLISH RR123: Composition, Logic and Linguistics **(2,0,0,2/2,0,0,2)**

This course provides review of the principles of clear expression through intensive, regular practice in applying them. It encourages clarity of thought and facility of expression by introducing students to the methods of logic and by opening a study of the English language over its historical development. Students will practice composition during the class periods, and no out of class assignments will be given.

ENGLISH RR211: Major Twentieth Century Authors **(3,0,0,4/-,-,-,-)**

A survey of recent English literature, its provenance and prospects. Emphasis will be placed on Yeats, Eliot, Jones among the poets, on Shaw, Fry, Pinter among the playwrights, on Waugh, Greene, Amis among the novelists.

Two essays will be required.

(To commence in academic year 1983/84).

ENGLISH RR213: English Literature from Blake and Gibbon to 1950 **(3,0,0,4/3,0,0,4)**

For second year Arts students.

Cadets working towards an Honours BA in English must obtain 66 per cent in English RR213 and a general average of 60 per cent.

This course, the second part of the two-year survey, traverses the period from Pope, Swift and Sterne to the 1950s. About half the time is given to poetry and about half to prose. A seminar is conducted during the Spring Term.

Cadets are encouraged to take original approaches and to practice self-expression with formal precision of statement. Wide background reading is stimulated and required.

Two major papers are required, as well as brief essays and rhetorical exercises.

ENGLISH RR222: Canadian Literature **(-,-,-,-/3,0,0,4)**

A study of themes and forms adopted by English authors in Canada, from Haliburton and Service to Birney, Buell and Buckler; problems of Canadian vis-a-vis British and United States literature.

Two essays will be required.

(To commence in academic year 1983/84.)

ENGLISH RR301: Canadian Literature **(3,0,0,4/-,-,-,-)**

A study of the themes, models, techniques, and problems of the English writer in Canada during two centuries. Wide background reading is stimulated and required.

Offered on demand. Prerequisite: consent of the instructor.

ENGLISH RR312: Literature of War **(-,-,-,-/3,0,0,4)**

This course is a study of views of war in Western literature from Homeric epic to modern novel. The literatures of tribal, classical, feudal, and industrial cultures will be examined and compared, with particular reference to ethical problems and concepts of heroism.

Two essays and one oral report are required from each cadet.

Offered on demand. Prerequisite: consent of the instructor.

PHILOSOPHY RR301: Introduction to Philosophy **(3,0,0,4/-,-,-,-)**

A survey of the problems of knowledge, nature, and morals, in which the philosophies studied range from Plato to Marx, from Aristotle to Lonergan. Frequent discussion is encouraged.

Offered on demand. Prerequisite: consent of the instructor.

PHILOSOPHY RR412: Perspectives in Philosophy **(-,-,-,-/3,0,0,4)**

Contemporary ideas of knowledge and action are traced from sources leading to Comte and Nietzche, as two extremes. Various types of current synthesis are examined in lectures and seminars. Topics include cybernetics, neuro-psychology, relativity, ontology, analogical concept, ecology of knowledge, ethics.

Offered on demand. Prerequisite: consent of the instructor.

Note: Details of individual courses offered at RMC or CMR should be obtained from their respective calendars.

DÉPARTEMENT DE FRANÇAIS

Professeur agrégé. Chef de département et directeur de langue seconde — C. Tchalékian, BSc, MA, PhD.

Professeur adjoint — C.M. Ramkeesoon, BA, MA, PhD.

Conseiller pédagogique — J. Landry, BA, DipEd

Chargés de cours — A. Allard, BA, MA
— C. Bordeleau-Zenko, BA
— A. Hadley, BA, DipEd
— C. Plows, BA
— F. Menard, BA
— J. Robichaud, BA, Licence (théologie)
— A. Tétreault, BA
— J. van Campen, BA, MA

Pour enseigner la langue seconde, les méthodes de base employées sont Dialogue Canada et les Ateliers.

Les cours de langue sont offerts en chacune des quatre années. Chaque élève suit cinq périodes de langue par semaine au cours des deux sessions.

Première année	Cours de langue I
Deuxième année	Cours de langue II
Troisième année	Cours de langue III
Quatrième année	Cours de langue IV

Royal Roads Military College utilise les méthodes suivantes pour noter et accréditer les cours de français langue seconde:

(a) Notes: L'attitude, l'effort et le progrès relatif seront notés en employant l'échelle militaire habituelle de A, B, C+, C, C−, D, F. Ces notes seront soumises à l'Escadre Militaire et feront partie du dossier de l'éducation de l'élève au Collège.

(b) Crédit: Pour chaque série de quinze leçons de Dialogue Canada complétée de façon satisfaisante, il sera accordé un crédit académique de trois unités. Cette mesure objective de proprès académique sera insrite sur le bulletin académique de l'élève. La note sera reportée comme "crédit" (CR), soutenu, si disponibles, par les scores de l'élève aux tests de la Fonction Publique, dans les catégories, compréhension auditive, expression orale, compréhension de l'écrit, et expression écrite.

Les élèves-officiers qui ont atteint le niveau fonctionnel bilingue ne suivent que trois périodes de langue par semaine. Les élèves-officiers francophones sont dispensés de suivre les cours de langue.

The Department of French offers courses in both second language training and in literature.

Courses in language training have the aim of bringing the cadet to the level of "functional bilingualism", i.e. Public Service Commission. Language Bureau test scores of at least 3 (listening comprehension); 3 (speaking ability); 2 (reading comprehension); and 2 (writing ability), where the scale of scores runs from 0 to 5 with the

latter corresponding to native fluency. Individuals who are "functionally bilingual" should be quite able to conduct business in their specialty in the second language. Nevertheless, they are required to attend 3 class periods a week in order to maintain their fluency.

The method used in language training courses is an audio-visual approach using *Dialogue Canada* and les *Ateliers*. All cadets are tested in second-language competence on entry and will be placed in appropriate sections of 6 to 10 students. Cadets will advance at their own pace and will be moved to more or less advanced sections as required.

Language training courses are designated by year only, with all cadets in first year being enrolled in Language Training I, second year cadets in Language Training II, etc. For cadets who have reached the "functionally bilingual" level, advanced courses meeting fewer periods per week are available (Language Training IA, IIA, etc.)

Language Training I	Conversational French	(0,3,2,0)/(0,3,2,0)
Language Training IA	Conversational French	(0,1,2,0)/(0,1,2,0)
Language Training II	Conversational French	(0,3,2,0)/(0,3,2,0)
Language Training IIA	Conversational French	(0,1,2,0)/(0,1,2,0)
Language Training III	Conversational French	(0,3,2,0)/(0,3,2,0)
Language Training IIIA	Conversational French	(0,1,2,0)/(0,1,2,0)
Language Training IV	Conversational French	(0,3,2,0)/(0,3,2,0)
Language Training IVA	Conversational French	(0,1,2,0)/(0,1,2,0)

Royal Roads Military College uses the following grading and accreditation procedures for second language training courses:

(a) **Grades:** Attitude, effort and relative progress in SLT courses will be graded using the usual military scale of A, B, C+, C, C−, D, F. These grades will be submitted to the Military Wing and will become part of the training record of the cadet at the College.

(b) **Credit:** For each fifteen lessons of Dialogue Canada satisfactorily completed, three units of academic credit will be granted. This objective measure of academic achievement will appear on the cadet's academic transcript. The grade will be reported as "credit" (CR) bolstered, if available, by the cadet's scores on the PSC tests of listening, speaking, reading, and writing.

Par surcroît le département de français offre des cours à crédit ceux d'en bas:

In addition, the Department of French offers advanced courses carrying credit as described below:

FRANÇAIS RR212: Cours de grammaire et de composition **(-,-,-,-/3,0,0,4)**

Destiné aux élèves-officiers de deuxième année en lettres qui désirent, en troisième année, s'orienter vers les lettres, avec specialisation.

Le cours comprend une révision de grammaire et la lecture, de plusieurs contes québécois. Des thèmes sont soumis au cours de l'année.

Offert sur demande. Pré-requis: Niveau fonctionnel ou accepté par le professeur.

FRENCH RR212: Grammar and Composition **(-,-,-,-/3,0,0,4)**

This course is designed for second year Arts students who intend to proceed with an Honours degree and who have attained a reasonable fluency in their second language.

The course content includes a review of grammar, some readings of French-Canadian short stories and some "thèmes" to translate into French. The course is conducted entirely in the second language.

Offered on demand. Prerequisite: Functional level or consent of the instructor.

FRANÇAIS RR311: Cours de grammaire **(3,0,0,4/-,-,-,-)**

Destiné aux élèves-officiers de deuxième année en lettres, de troisième et de quatrième année.

Le cours comprend une révision approfondie de la grammaire, la lecture des auteurs Canadien-Français, des compositions et des thèmes. Bref, le candidat acroitra sa compétence en la seconde langue, en pratiquant la compréhension et l'expression orales.

Offert sur demande. Pré-requis: accepté par le professeur.

FRENCH RR311: Advanced Grammar and Composition **(3,0,0,4/-,-,-,-)**

For second year Arts, third and fourth year students. This course is offered to students who have attained, or who are close to attaining "functional" levels of bilingualism.

The course consists of an in-depth review of grammar, readings of short stories by French-Canadian writers, compositions and "thèmes".

Offered on demand. Prerequisite: consent of the instructor.

FRANÇAIS RR412: Introduction à la littérature et à la culture du Canada-Français **(-,-,-,-/3,0,0,4)**

Destiné aux élèves-officiers de deuxième année en lettres, de troisième et de quatrième année.

Les candidats doivent s'exprimer couramment et écrire convenablement la langue seconde. L'étude des écrivains Canadien-Français par la lecture et l'évaluation critique des morceaux choisis des origines à nos jours.

Offert sur demande. Pré-requis: accepté par le professeur.

FRENCH RR412: Introduction to the Literature and Culture of French Canada **(-,-,-,-/3,0,0,4)**

For second year Arts, third and fourth year students.

Candidates must express themselves fluently and write their second language competently. The study of French-Canadian writers will be carried out through the reading and critical evaluation of selected passages from the earliest writers to those of the modern days.

Offered on demand. Prerequisite: Consent of the instructor.

Note: Details of individual courses offered at RMC or CMR should be obtained from their respective calendars.

DEPARTMENT OF HISTORY AND POLITICAL ECONOMY

Professor and Dean of Arts — W. Rodney, DFC and Bar, BA, MA, PhD, FRGS, FR Hist S.

Associate Professor and Head of Department — J.A. Boutilier, BA, MA, PhD

Professor — A.D. Wallis, CD, rmc, psac, BA, MA

Associate Professor — P.J.S. Dunnett, BSc, MA, PhD

Assistant Professor — J.A. Bayer, BA, MA, PhD

Assistant Professor — G.A. Martel, BA, MA, PhD

Special Lecturer — Major K.R. Merkley, CD, BA, MA

Special Lecturer — W.T. Mann, BCom, FCGA

HISTORY RR113: Modern European History 800-1950 **(3,0,0,4/3,0,0,4)**

OR

HISTORY RR111 **(3,0,0,4/-,-,-,-)**

HISTORY RR112 **(-,-,-,-/3,0,0,4)**

For first year Arts students or for second year Arts students who have completed their first year in Science and Engineering.

A survey of European civilization from the age of Charlemagne to the Twentieth Century with emphasis upon economic, political, and social changes; military organization and techniques; the impact of new ideas upon states; the relation of new concepts to conflicts within and between states, and their resolution.

Second year Arts students who have completed their first year in Science and Engineering will cover the period up to the French Revolution in the first semester and may then write a final examination in HISTORY RR111; or they may continue into the second semester and write a final examination in HISTORY RR113 at the end of the second semester.

HISTORY RR202: Modern Europe **(-,-,-,-/3,0,0,4)**

For second year Science and Engineering students.

A survey of the history of European civilization from the French Revolution to the Twentieth Century; the fundamental changes in economic and military techniques and their impact on political and social organization; the development of ideas; the relation of these ideas to conflicts between states or within states, and the solution of these conflicts.

HISTORY RR213: Canada **(3,0,0,4/3,0,0,4)**

For second year Arts students.

The history of Canada from earliest times to the present. Directed reading, essays, and seminar discussions, supplemented by lectures covering various aspects of economic, political, military, and social development.

HISTORY RR302: Technology and War 1914 to Present **(-,-,-,-/3,0,0,4)**

A survey of technological innovation since the Great War with emphasis on the development and adaptation of communications, computers, detection techniques, explosives, and weapons systems. Examples will be drawn from colonial conflicts, World War II, Korea, and Vietnam. Some attention will be devoted to contemporary developments and trends.

HISTORY RR343: The Military in the Modern World **(3,0,0,4/3,0,0,4)**

An examination of the military as an institution in modern life. Beginning with the army of Napoleon, and its revolutionary and eighteenth-century antecedents, we follow the changing structure and role of military organizations as they developed through the nineteenth and twentieth centuries. Included are such themes as the creation of general staffs, the military in politics, the military in the 'third world', conscription and volunteer armies, the growth of professional ideals, the role of technology and ideology, and men in battle.

HISTORY RR411: America as a World Power **(3,0,0,4/-,-,-,-)**

A survey of United State's foreign relations from the Spanish-American War to America's withdrawal from Vietnam. It analyses the transformation of the United States from colonial to great power status, with attention upon the internal dynamics of that evolution as well as external causes. America's foreign policies are considered in relation to the nation's economic growth and cultural development, its involvement in wars, and the advent of the Truman Doctrine, the Marshal Plan, NATO, SEATO, and NORAD. Particular emphasis is given to the impact of industrial development and technological change, coupled with the role of ideology in the political decision-making process, including changes in strategic thinking and diplomatic method.

HISTORY RR 421: Naval History in the Twentieth Century **(3,0,0,4/-,-,-,-)**

This course examines the emergence and eclipse of Japan as a major naval power, the decline of the Royal Navy, the character of critical naval engagements in the First and Second World Wars, the growth of the American and Soviet navies, the role of the Royal Canadian Navy in war and peace, and changes in naval technology and doctrine.

HISTORY RR432: China and Japan in the Twentieth Century **(-,-,-,-/3,0,0,4)**

This course examines: the rise of Japan as an imperial power; the 1911 Revolution in China and ensuing warlord era; the struggle between the Kuomintang and communist forces in China prior to the Pacific War; the Pacific War; the Chinese Revolution of 1949; the American occupation of Japan; the Korean War; the dramatic growth of the Japanese economy; the cultural revolution in China; the rapproachment between China and the Western powers; and the new economic, political, and military balance in East Asia.

HISTORY RR443: Honours Thesis **(3,0,0,4/3,0,0,4)**

During the fourth year, honours students will be required to undertake a research project or "honours thesis" extending over two terms, directed by a supervisor. Students will be required to speak on their research topic during the first term, and defend their findings in an oral examination at the end of the second semester.

HISTORY RR452: Soviet Russia as a World Power **(-,-,-,-/3,0,0,4)**

Establishment and consolidation of Soviet power; NEP and its repercussions; Stalinization; Comintern; the evolution of Soviet foreign policy and the development of Soviet military power.

HISTORY RR471: The Pacific Rim and East Asia to 1905 **(3,0,0,4/-,-,-,-)**

This course examines the European exploration of the Pacific Basin, the establishment of European colonial empires throughout the region,the response of indigenous cultures to European contact, the growth of great power interests in the area, and the emergence of the modern state of Japan.

ECONOMICS RR201: Introduction to Economics **(3,0,0,4/-,-,-,-)**

For second year Science and Engineering students.

A general survey of the field of economic behaviour designed to enable prospective Service officers to understand some of the major problems of domestic and world economics. Specific attention is paid to analyses of supply and demand; the theory of the firm; markets and pricing; national income, employment, and fiscal policy; international trade; money and banking; war economics.

ECONOMICS RR213: Principles of Economics **(3,0,0,4/3,0,0,4)**

For second year Arts students.

This course amplifies the material covered in Economics RR201 and includes research projects calculated to enrich a principles course.

COMMERCE RR203: Accounting **(3,0,0,4/3,0,0,4)**

For second year Arts students intending to pursue a degree in Administration at Collège militaire royal de Saint-Jean.

With Faculty Council permission, also available as an arts option to other cadets.

Basic elements of accounting method. Analysis of financial transactions. The recognition of revenue and expense. Financial statement preparation. Recognition of profit. Introduction to analysis of funds flow, cost control and identification of costs, budgetary planning and control systems and accounting for corporations and partnerships.

POLITICAL SCIENCE RR102: Introduction to Political Science **(-,-,-,-/3,0,0,4)**

For first year Arts students.

This course is in two parts: a survey of the history of political theory from Machiavelli to Marx, and an examination of the main political movements and forces in world politics in the 20th century.

POLITICAL SCIENCE RR213: International Politics **(3,0,0,4/3,0,0,4)**

A study of factors governing international relations with emphasis on the role of organizations such as the League of Nations and the United Nations. Examples will be drawn from the foreign policies of major powers (China, France, Great Britain, USA, USSR).

POLITICAL SCIENCE RR302: Crisis and War in International Relations **(-,-,-,-/3,0,0,4)**

The course is intended to give military officers insight into the nature of the international political system, crisis, and war. It is divided into two sections:

(a) an introduction to basic concepts of international politics; discussions of the international political process, the motivation of states and their mutual impact;
(b) examination of theories of war causation, alternatives to war, attitudes to war, national forces, diplomatic crises, modes of control of conduct of hostilities.

Offered in alternate years, commencing 1982/83.

POLITICAL SCIENCE RR321: Irregular Warfare **(3,0,0,4/-,-,-,-)**

A survey of the uses of intelligence, subversion, and terrorism as techniques for the disruption of the nation state's security.

Offered in alternate years, commencing 1983/84.

POLITICAL SCIENCE RR332: Arms Control **(-,-,-,-/3,0,0,4)**

The examination of weapons technology and military strategy in the USA-USSR arms race, with particular reference to their relationship in the emergence of detente. Topics considered will include SALT ONE and TWO, CTB, BSCE, MBFR, and PTB.

Offered in alternate years, commencing 1983/84.

POLITICAL SCIENCE RR343: Modern Strategic Thought 1815-1980 **(3,0,0,4/3,0,0,4)**

This survey will range from the classical views of battle and siege warfare, to the theories of strategies such as Clausewitz, and the exponents of air, land, and sea power. Examples of applied strategy, mostly taken from twentieth century conflicts, will be used.

POLITICAL SCIENCE RR441: Canadian Foreign Policy **(3,0,0,4/-,-,-,-)**

An analysis of the significant factors which determine Canadian foreign, defence, and trade policies.

Offered in alternate years, commencing 1982/83.

ELECTIVES

The following courses may be taken by cadets in third and fourth year as an Arts elective, and by cadets in second year Arts, Administration, or General Science as an extra course (Faculty Council approval required for extra courses). These courses will be offered only on sufficient demand (four or more students).

HISTORY RR331: Historiography and Methodology **(3,0,0,4/-,-,-,-)**

This course is given by members of the Department of History and Political Economy and is designed to introduce students to research and writing techniques as well as the problems of historiography.

Offered on demand. Prerequisite: Consent of the instructor.

ECONOMICS RR312: The Canadian Economy **(-,-,-,-/3,0,0,4)**

An examination of contemporary economic issues in Canada; inflation, unemployment, immigration, the economic basis of nationalism, separatism, trade unionism, and the role of multi-national corporations.

Offered on demand. Prerequisite: consent of the instructor.

ECONOMICS RR321: The Economics of Defence **(3,0,0,4/-,-,-,-)**

An examination of the implications of Canadian defence policy upon the Canadian economy, and the constraints placed by economic considerations.

Offered on demand. Prerequisite: consent of the instructor.

ECONOMICS RR332: Canadian Economic History **(-,-,-,-/3,0,0,4)**

This course examines the development of the Canadian economy to the present day. The roles of labour, capital and technology are analysed in the light of modern growth theories.

Offered on demand. Prerequisite: consent of the instructor.

ECONOMICS RR402: Labour Economics **(-,-,-,-/3,0,0,4)**

Using Canadian applications this course studies the labour supply and the determination of wages. Topics to be covered will include labour force participation, labour mobility, the role of unions, the changing composition of the workforce, trends in hours of work, unemployment, manpower policy and incomes policy.

Offered on demand. Prerequisite: consent of the instructor.

ECONOMICS RR412: Industrial Organization **(-,-,-,-/3,0,0,4)**

Industrial Organization examines the structure, conduct and performance of industry. Topics to be covered will include: industry concentration, economics of scale, patents, vertical integration and barriers to entry, the goals of the firm, the growth of the firm, multi-nationals, advertising, price formation and government influences on industrial organization.

Offered on demand. Prerequisite: consent of the instructor.

Note: Details of individual courses offered at RMC or CMR should be obtained from their respective calendars.

DEPARTMENT OF MATHEMATICS

Professor and Head of the Department — G.M. Lancaster, BSc, PhD

Associate Professor — M.J. Wilmut, ndc, BSc, MA, PhD

Associate Professor — R.C. Snell, BSc, MSc, PhD

Associate Professor — W.W. Wolfe, BSc, MSc, PhD

Assistant Professor — P. Smart, BSc, BEd, MEd, MPA, PhD (On leave of absence 1982-83)

Assistant Professor — F. Milinazzo, BSc, PhD, (on leave of absence 1981-83)

Assistant Professor — S.D. Wray, BSc, BSc (Hon), MSc, PhD

Assistant Professor — D.B. Kerrighan, BSc, PhD

Assistant Professor — W. Babinchuk, BSc, MSc

Special Lecturer — Captain D.L. Christensen, rmc, BSc

COMPUTER SCIENCE RR102: An Introduction to Computer Programming **(-,-,-,-/1,0,1,2)**

For first year Arts or Administration students.

Cadets will be introduced to the FORTRAN language. Proficiency in programming will be achieved by writing programs to solve problems. Fundamental techniques of file manipulation and information retrieval useful to managers will be covered.

COMPUTER SCIENCE RR122: An Introduction to Computer Programming and Numerical Analysis **(-,-,-,-/2,0,2,4)**

For first year Science or Engineering students.

An introduction to programming and problem solving on a computer. FORTRAN and elements of structured programming, de-bugging, and basic concepts of system hardware, numerical methods such as root finding and quadrature.

MATHEMATICS RR103: Calculus and Analytic Geometry **(3,2,0,4/3,2,0,4)**

For first year Arts students.

An introduction to the Calculus of one and two variables, including geometric vectors. The emphasis is on non-science applications and includes the mathematics of finance.

MATHEMATICS RR113: Calculus and Linear Algebra **(5,3,0,5/5,2,0,5)**

For first year Science and Engineering students.

This course includes the normal topics of a first year calculus course and selected topics from elementary linear algebra. Topics from both areas will be selected in each semester.

Algebra. Sets, relations, and functions: vector algebra with applications to geometry in two and three dimensions; quadric surfaces; determinants; and complex numbers.

Calculus. An introductory course in differential and integral calculus, including differentiation of algebraic, trigonometric, and other elementary functions; related rates; slopes, maxima and minima, and inflection points; curve sketching, the differential; the definite integral and applications to areas, volumes, arc length, surfaces, centroids, moments of inertia, and other physical problems; simple separable differential equations. Analytic geometry of the straight line and conics, including polar co-ordinates and parametric equations; techniques of integration. Indeterminate forms. Improper integrals. Hyperbolic functions and partial fractions are introduced as the need arises in the calculus.

MATHEMATICS RR203: Calculus, Linear Algebra, Probability and Statistics, Operations Research **(3,2,0,4/3,2,0,4)**

For second year Arts students.

Selected topics from linear algebra, probability, statistics, game theory, linear programming, network and graph theory.

MATHEMATICS RR223: Calculus, Vector Calculus, and Differential Equations **(3,1,0,3/3,1,0,3)**

For General Science students and most Engineering students.

Partial differentiation with applications to maxima and minima in several variables, indeterminate forms, multiple integration, vector analysis including Greene's divergence, and Stoke's Theorems, and infinite series.

Differential equations of first order, linear equations of higher order with constant coefficients, applications.

MATHEMATICS RR233: Calculus, Vector Calculus, and Differential Equations **(4,1,0,4/4,1,0,4)**

Recommended for those students who plan on choosing Honours Science, Engineering Physics, or Electrical Engineering programs of study.

This course will include all of the topics of Mathematics RR223 but with more rigorous treatment. The study of differential equations will include Laplace transforms and applications, and the gamma function. Elements of Fourier series are included in the study of infinite series.

This course may be taken only with the approval of the Department of Mathematics.

MATHEMATICS RR241: Probability and Statistics **(2,1,0,2/-,-,-,-)**

For second year Engineering students.

Optional for General Science students.

Elementary probability; organization and analysis of data; discrete and continuous distributions; elementary estimation theory and hypothesis testing.

MATHEMATICS RR252: Linear Algebra, Elements of Operations Research **(-,-,-,-/2,1,0,2)**

For second year Engineering students; optional for General Science students.

Matrix transformations; systems of linear equations; abstract vector spaces; subspaces, linear transformations; isomorphisms; co-ordinatization of vectors; characteristic values and vectors; diagonalization Cayley-Hamilton theorem; and linear programming.

MATHEMATICS RR261: Probability and Statistics **(2,1,0,2/-,-,-,-)**

Recommended for those students who plan on choosing Honours Science, Engineering Physics, or Electrical Engineering.

The topics are those of Mathematics RR241 with greater emphasis placed on theoretical considerations. This course may be taken only with the approval of the Department of Mathematics.

MATHEMATICS RR272: Linear Algebra and Elements of Operations Research **(-,-,-,-/2,1,0,2)**

Recommended for those students who plan on choosing Honours Science, Engineering Physics, or Electrical Engineering.

The topics are those of Mathematics RR252, with greater emphasis placed on theoretical considerations.

This course may be taken only with the approval of the Department of Mathematics.

MATHEMATICS RR301: Differential Equations **(3,0,0,4/-,-,-,-)**

Laplace Transform methods for solving ordinary differential equations; series solutions; solution of partial differential equations using separation of variables, the principle of super-position and Fourier series; applications to problems such as wave motion, heat transfer, gravitational potential, control theory, and Sturm-Liouville systems.

Prerequisite: Mathematics RR223, RR252 or permission of the Department.

COMPUTER SCIENCE RR301: Introduction to Computer Systems **(4,0,2,5/-,-,-,-)**

Computer structure and machine language; assembly language programming, addressing techniques; macros. Data coding; number representation and arithmetic. Sub-routine linkage and recursion. Use of sequential and random access files.

Prerequisite: CS RR201.

COMPUTER SCIENCE RR312: Numerical Analysis **(-,-,-,-/3,0,0,4)**

Numerical solutions of problems encountered in applied mathematics using the computer, numerical integration, solutions of ordinary differential equations; roots of equations; simulation techniques.

Prerequisites: Mathematics RR223, RR252, RR301, Computer Science RR201.

MATHEMATICS RR401: Complex Analysis **(3,0,0,4/-,-,-,-)**

Continuity, differentiability of functions of a complex variable; analytic functions; Cauchy-Reimann conditions; integration; Cauchy's Theorem and formulas; Maximum modulus theorem; Liouville's theorem; series representations; Laurent series; singularities; residue theorem and applications; elementary conformal mappings.

Prerequisite: Mathematics RR301.

MATHEMATICS RR412: Signal Processing **(-,-,-,-/3,0,0,4)**

Frequency domain signal analysis; linear systems; filtering; signal detection. Discrete systems including digital filter design and the Fast Fourier Transform.

Prerequisite: Mathematics RR301, RR401.

COMPUTER SCIENCE RR401: Interfacing Computers and Peripherals **(2,0,4,4/-,-,-,-)**

The application of hardware and software concepts from previous courses to problems involved with adding peripherals such as floppy disks, DMA controller, GPIB, video monitors and digital motors to computer systems will be discussed. Small individual projects will be undertaken.

Prerequisite: CS RR322.

Note: Details of individual courses offered at RMC or CMR should be obtained from their respective calendars.

DEPARTMENT OF MILITARY LEADERSHIP AND MANAGEMENT

Special Lecturer and Head of Department — LCdr D.L. Lang, CD, BA, BEd, MA

Special Lecturer — Captain M. Plul, CD, BA, BEd, MSW

MILITARY LEADERSHIP AND MANAGEMENT
RR111: Psychology of the Individual **(3,0,0,4/-,-,-,-)**

An introduction of those areas of human development and behaviour that are relevant to a future leader's needs and interests. The course commences with an exposure to the fundamental topics and elementary psychological vocabulary necessary for the understanding of the rationale of individual differences. These topics are then related to certain developmental and social psychological concepts with a view to understanding human behaviour in situations where there is a requirement to influence the behaviour of others. To this end, elementary topics of perception, learning, motivation, intelligence, personality, adjustment, and maturation will be related to concepts of social structure, individual socialization, attitude formation, and interpersonal processes.

MILITARY LEADERSHIP AND MANAGEMENT
RR212: Social Psychology **(-,-,-,-/3,0,0,4)**

The basic objective is to introduce and acquaint the student with the broad field of social psychology. The course is designed to provide a fundamental understanding of human social behaviour. Emphasis is placed on the types and degrees of social influences on individuals by groups. An awareness of the dynamic components of social behaviour will contribute to the development of effective leadership and management principles and help the student to prepare for a career as a military officer. Topics will be selected from social perception, norms, attitudes and persuasion, conformity, obedience, groups and group behaviour, aggression, violence and conflict, and social power. In addition, professional officer development and leadership theories and approaches will be presented.

MILITARY LEADERSHIP AND MANAGEMENT
RR311: Principles of Administration and Supervisory Management **(3,0,0,4/-,-,-.-)**

The course objective is to develop in the student an awareness of administration and supervisory management. Topics to be covered include functions of management, communications, economics, human relations, teamwork, employee performance, allocation and schedule of work, induction of new employees, giving orders, controlling employee behaviour, use of the interview, problem solving, developing a training program, holding group discussions, simplifying and improving work, and managing paper. Emphasis will be on administration and supervisory management as it is practiced in the Canadian Forces.

MILITARY LEADERSHIP AND MANAGEMENT

RR402: Seminars in Personnel Management **(-,-,-,-/3,0,0,4)**

Commencing with seminars on the theories of McGregor (theory X-theory Y), Maslow (need hierarchy), Herzberg (the motivation-hygiene theory), Drucker (management by objectives) and Allport (nature of man), subsequent seminars will relate these to the CF personnel system in an examination of such topics as performance evaluation, job satisfaction, counselling, punishment, communication, and leadership.

Note: Details of individual courses offered at RMC or CMR should be obtained from their respective calendars.

DEPARTMENT OF PHYSICS

Associate Professor and Head of the Department — D.P. Krauel, BSc, MSc, PhD

Professor and Dean of Science and Engineering — H.J. Duffus, ndc, BA, BASc, DPhil, PEng.

Associate Professor — W.T. MacFarlane, BA, MSc, PhD.

Associate Professor — M.J. Press, BSc, MSc, PhD

Assistant Professor — N.S. Ho, BSc, MA, PhD

Assistant Professor — J.M. Gilliland, BSc, MA, PhD

Assistant Professor — P.J. Schurer, BSc, MSc, PhD

Assistant Professor — R.F. Marsden, rmc, BSc, PhD

Program Coordinator RRMC Coastal Marine Science Laboratory — W.N. English, BA, PhD

Laboratory exercises are designed to supplement and illustrate the work discussed in the lecture courses, and to provide training in methods of measurement and experiment design. Satisfactory laboratory work must be achieved in order to obtain pass standing.

PHYSICAL SCIENCE COURSES

Chemistry RR123 followed by Physics RR123, make up terminal courses in physical science for students entering the Arts program of studies. The courses cover a traditional outline of the physical sciences and introduce some aspects of modern science. Calculus is not a prerequisite.

PHYSICS RR123: Physical Science **(3,0,3,4/3,0,3,4)**

Physics RR123 consists of two main sections.

One section deals with the concepts of force, mass, length, time, momentum, kinetic energy, potential energy, work and inertia in Newtonian Systems; some ideas of the Special Theory of Relativity are introduced.

The other section deals with the fundamental ideas of the electric field, potential, capacity, resistance, DC and AC circuits, the magnetic field, and the electro-magnetic properties of materials. Aspects of acoustics, optics and radio waves that particularly affect the Canadian Forces may be studied, as time allows.

PHYSICS RR101: Mechanics **(4,1,3,5/-,-,-,-)**

For first year cadets taking the Science and Engineering program of studies.

Newtonian mechanics of particles and rigid bodies are studied, using vector methods and simple applications of integral and differential calculus. The course is taught with the help of members of the Engineering Department, who emphasize engineering statics.

PHYSICS RR112: Electricity and Magnetism **(-,-,-,-/4,1,3,5)**

For first year cadets taking the Science and Engineering program of studies.

Electrostatics, direct current electricity, magnetism and elementary current induction are studied using vector methods and elementary calculus.

PHYSICS RR201: Electricity **(4,1,3,5/-,-,-,-)**

For second year cadets taking the Science or Engineering programs of study.

AC circuits, including series and parallel resonant circuits, are analysed using Kirchhoff's laws and phasor methods. The transient response of simple circuits is analysed. Electric and magnetic fields in free space and matter are studied. An introduction is made to Maxwell's equations.

Prerequisites: Physics RR101, RR112, Mathematics RR113

PHYSICS RR212: Modern Physics **(-,-,-,-/4,1,3,5)**

For second year students taking the Science or Engineering programs of study.

About half of the course is devoted to a general study of oscillations and waves. The remainder is devoted to modern physics as developed by Einstein, De Broglie, Heisenberg, Bohr, and Schrodinger.

The laboratory deals with experiments demonstrating the ideas and techniques of modern physics. Use is made of computers in the laboratory to facilitate the measurement and analysis of data.

Prerequisites: Physics RR101, RR112, and Mathematics RR113

PHYSICS RR332: Electromagnetic Wave Propagation **(-,-,-,-/3,0,3,4)**

This course deals with the creation, propagation, reflection and absorption of electromagnetic waves in homogeneous isotropic or layered media, and by transmission lines, wave guides, antennas, and cavities.

Prerequisites: Physics RR112, RR201, RR212, Mathematics RR301

PHYSICS RR352: Intermediate Mechanics **(-,-,-,-/3,0,0,4)**

This course lays the foundation for applications of classical and quantum mechanics studied in Physics RR411, RR421 and RR432. Methods of handling systems and rigid body dynamics in three dimensions are studied, including the use of Lagrange's equations and the use of accelerated coordinate frame equations.

Prerequisites: Physics RR101, RR212.

PHYSICS RR361: Acoustics **(2,0,0,3/-,-,-,-)**

This course deals with the creation, propagation, reflection and absorption of acoustic waves in homogeneous or horizontally layered media, sound ducts and real oceans. Applications to communication, exploration geophysics, and particularly to underwater detection and surveillance are discussed.

Prerequisites: Physics RR101, RR212, Mathematics RR301

PHYSICS RR371: Electronics and Microcomputers **(3,0,3,4/-,-,-,-)**

The course can be broken into three main sections. I. Analog electronics: theory of operation of diodes and transistors and typical solid state circuits, operational amplifiers and analog control theory. II. Digital electronics: gates, counters, registers, ROM, RAM, multiplexers, analog-digital and digital-analog conversion. III. Introduction to microcomputers: architecture, timing, input-output, interfacing, simple programming and digital control.

The laboratory work deals with experiments on analog (25%) and digital (25%) electronics and with experiments involving simple programming, input-output and timing on single-board microcomputers.

Prerequisites: Physics RR112, RR201.

PHYSICS RR421: Atomic Physics **(3,0,0,4/-,-,-,-)**

This course deals with the quantum theory of the electronic structure of the atom. Applications to optical and solid state devices are discussed, e.g. lasers, magnetometers, fibre optics, integrated circuits, spectroscopy, and remote sensing.

Prerequisite: Physics RR332

PHYSICS RR432: Applied Nuclear Physics **(-,-,-,-/3,0,0,4)**

This course deals with phenomenological aspects of nuclear physics. Topics discussed are Rutherford scattering, radiation monitoring and nuclear hazards, nuclear composition and binding energy, radioactivity, nuclear reactors and radiation shielding.

Prerequisites: Physics RR332, RR352.

PHYSICS RR441: Solid State Physics with Applications **(3,0,3,4/-,-,-,-)**

A discussion of the solid state of matter from a non-quantum approach; emphasis on coherent long-range phenomena (super conductivity, super fluidity); bosons and fermions; lattice dynamics (energy bands, phonons); transistor operation; principles of operation of SQUIDS, LASER, MASER, low-temperature receivers; applications to computers (magnetic bubbles, Josephson junctions, CCD).

OCEANOGRAPHY RR301: Descriptive Oceanography **(3,0,0,4/-,-,-,-)**

This course gives a general introduction to the oceans. The principal topics covered are: a survey of the physical properties of sea water; the distribution of salinity,

temperature, etc., and their seasonal variations; the circulation of the oceans; energy budgets; oceanographic instrumentation and measurement techniques; and underwater sound velocity distributions as a result of temperature and salinity variations.

OCEANOGRAPHY RR341: Practical Oceanography (0,0,3,1/-,-,-,-)

Field experience is obtained in a local coastal environment. Measurement of current, temperature, salinity, etc. are taken. Data reduction, interpretation, and a final report are required.

OCEANOGRAPHY RR401: Geophysics and Geology (3,0,0,4/-,-,-,-)

This course gives a general introduction to the physics of the earth within the framework of global plate tectonics. Following a discussion of the plate tectonic hypothesis and the differences between ocean floors and continental surfaces, the main topics are: gravimetry and the interpretation of gravity anomalies; the Earth's rotation, tides, and the shape of the earth; geomagnetism and paleomagnetism; geothermal studies; marine geophysics and geophysical prospecting.

Prerequisites: Physics RR371, RR332, Mathematics RR301

OCEANOGRAPHY RR412: Aeronomy (-,-,-,-/3,0,0,4)

This course deals principally with the atmosphere and its interaction with the oceans. Major topics covered are: the composition and properties of the atmosphere; comparison of dynamics of the atmosphere to the dynamics of the ocean; thermodynamics of the atmosphere; water vapour and cloud formation; solar and terrestrial radiation; transfer processes, including air-sea-ice interaction; satellites, remote sensing and interpretation of satellite imagery; magnetic fields and ionospheric physics; instruments, observations and their presentation; synoptic patterns; and military applications.

Prerequisites: Physics RR201, RR212, Mathematics RR223

OCEANOGRAPHY RR431: Practical Oceanography (0,0,3,1/-,-,-,-)

This course usually takes the form of a field project. Project topics are chosen in consultation with the instructor. Examples of acceptable topics: the measurement of seawater properties; bottom sampling; seismic experiments; coastal gravimetry; geomagnetic studies, etc. Data reduction, interpretation and a final report are required.

Prerequisite: Oceanography RR301.

OCEANOGRAPHY RR432: Practical Oceanography (-,-,-,-/0,0,3,1)

Field experience is obtained in a local coastal environment. Measurement of current, temperature, salinity, etc. are taken. Data reduction, interpretation, and a final report are required.

Prerequisite: Oceanography RR301

OCEANOGRAPHY RR451: Introduction to Dynamic Oceanography **(3,0,0,4/-,-,-,-)**

The equations of motion and continuity are developed and applied to hydrostatics, geostrophic and wind-driven currents, thermohaline circulation, waves, tides, and estuarine circulation.

Prerequisite: Oceanography RR301

OCEANOGRAPHY RR462: Advanced Dynamic Oceanography **(-,-,-,-/3,0,0,4)**

For students in the combined major or honours program. Selected topics in turbulence, turbulent diffusion, waves, design of experiments, and analysis of data.

Prerequisite: Oceanography RR301, RR451

OCEANOGRAPHY RR483: Oceanography Project **(0,1,3,2/0,1,3,2)**

Fourth year cadets in the honours program, working singly or in syndicates, work on an experimental or theoretical project in the general area of oceanography with members of the staff of the Department of Chemistry, Engineering, Mathematics or Physics. A written report is required.

OCEANOGRAPHY RR492: Oceanography Seminar **(-,-,-,-/0,0,2,0)**

A series of lectures on various topics in oceanography, presented by guest speakers, members of the college staff, and by Officer Cadets in the Honours program.

COMPUTER SCIENCE RR322: Microcomputer Systems **(-,-,-,-/2,0,4,4)**

Comparison of machine architecture and instruction sets; parallel and serial data communication, handshaking; interrupt processing; instruction timing; relocatable software; compilers; A/D and D/A converters. Use of logic analyzers and development systems as analysis and debugging tools will be emphasized.

Prerequisites: Physics RR371, CS RR301.

Note: Details of individual courses offered at RMC or CMR should be obtained from their respective calendars.

DRILL

Officer in Charge of Drill — Captain R.N. Hardman, CD, rmc, plsc, BA

Drill Sergeant Major — MWO L.P. Baumgarten, CD

Instructor — WO J.H. Bentley, CD

Instructor — Sgt. G.A. Mason, C.D.

The objectives of the Drill program are to teach the officer cadets the fundamentals of drill as required in the Canadian Forces, to develop discipline and esprit de corps, to stimulate the power of command through mutual instruction, and to promote leadership through responsibility in handling groups of officer cadets.

Reference: A-PD-201-000/PT-000 — Canadian Forces Manual of Drill and Ceremonial.

DRILL RR103 **(0,0,1,0/0,0,1,0)**

Includes rifle, foot, and ceremonial drill.

DRILL RR203 **(0,0,1,0/0,0,1,0)**

In addition to rifle, foot, and ceremonial drill, this course includes sword drill and mutual instruction.

DRILL RR303 **(0,0,1,0/0,0,1,0)**

Includes rifle, foot, sword, and colours drill, as well as ceremonial and mutual instruction.

DRILL RR403 **(0,0,1,0/0,0,1,0)**

Reviews of all phases of drill previously taught.

Note: Details of individual courses offered at RMC or CMR should be obtained from their respective calendars.

DEPARTMENT OF PHYSICAL EDUCATION AND ATHLETICS

Captain K.M. Benoit, CD, rmc, BSc

Captain H.R. Schilds, CD

MWO R. Bootland, CD

Sgt. K.V. Roberts, CD

Sgt. W.E. Sears, CD

MCpl J.J. McQueen, CD

The aims of the Physical Education and Athletic Program are to create and maintain physical fitness, to develop leadership qualities, and to engender habits necessary for maintaining the standards of physical fitness required by officers throughout their service careers. The program is broken down into instructional as well as recreational phases. A progressive four year program designed for the Canadian Military Colleges is followed.

PHYSICAL EDUCATION RR103 **(0,0,2,0/0,0,2,0)**

The instructional phase of this course covers personal conditioning activities, combatives (wrestling) and aquatics. Physiological fitness tests are conducted to further assess individual capabilities and improvement.

In the recreational phase of this course, practical participation in major team games is introduced, with participation compulsory in at least three of the college intramural sports. In conjunction with participation as players, cadets are also involved actively in officiating various sports.

PHYSICAL EDUCATION RR203 **(0,0,2,0/0,0,2,0)**

The instructional phase of this course branches into a core elective program. Electives offered include soccer, hockey, squash, basketball, volleyball, and aquatics. The high level of instructor ability allows the cadet to develop his potential in each activity. An example is the aquatic program and, although all cadets must attain the Military Swim Standard, instruction to Red Cross Senior level is available.

The recreational phase is a continuation of PE RR103 by maintenance of compulsory participation in three intramural sports (two of which must be different from first year). Cadets are again active in officiating. As well, participation in the organization and conduct of various special events is introduced.

PHYSICAL EDUCATION RR303 **(0,0,2,0/0,0,2,0)**

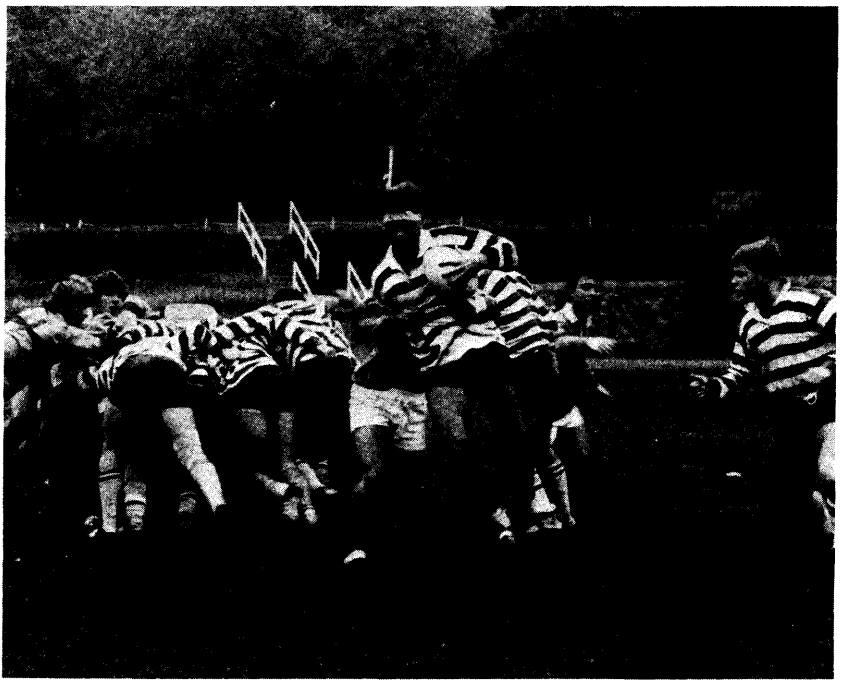
The instructional phase continues the comprehensive elective program, offering instruction in basketball, badminton, golf, squash, tennis, and aquatics. Cadets choose sports in which they may pursue further personal development of skills.

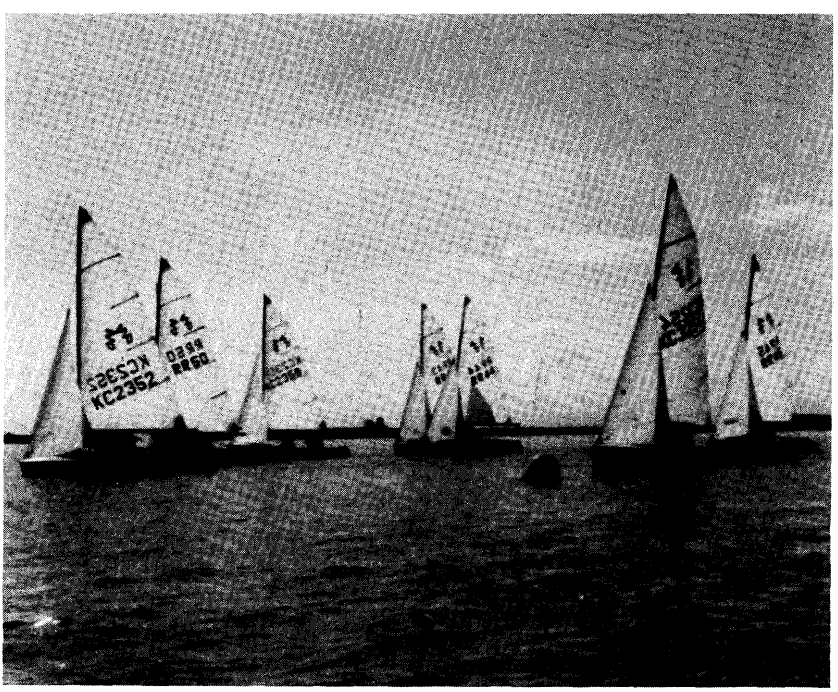
The recreational phase continues compulsory participation in two intramural sports (one of which must be new to the cadet). Cadets also become involved in the leadership and management of the various recreation clubs at the college, ranging in scope from a camera club to a scuba club. Approximately fifteen such clubs operate at Royal Roads.

PHYSICAL EDUCATION RR403 **(0,0,2,0/0,0,2,0)**

The instructional phase electives offered are badminton, squash, curling, tennis, volleyball, and aquatics. As well, specific instruction is given related to post graduation career responsibilities and duties related to the PE field.

The recreational phase is a continuation of that programmed in PE RR303.




KC2352

ACADEMIC REGULATIONS

DEFINITIONS

Student: A member of the Canadian Forces attending Royal Roads Military College to study full time for a degree. Such students may be of the following types:

a. **Officer Cadet:** a student attending RRMC under the Regular Officer Training Plan (ROTP), the Reserve Entry Training Plan (RETP), or the University Training Plan — Men (UTPM).

b. **Officer:** a student attending RRMC under the University Training Plan — Officers (UTPO).

c. **Special Student:** other members of the Canadian Forces taking one or more courses at RRMC on a part-time basis. The academic regulations which follow do not apply to special students except where specifically noted.

Program of Study: A group of courses comprising a year's program of studies, e.g. Mechanical Engineering, Physics and Oceanography, etc.

Subject: A division of the program of studies, e.g., physics, history, etc.

Course: A series of lectures and/or laboratory sessions in a given subject, designated by a number and for which an annual or semester assessment must be provided, e.g., Chemistry RR103, Oceanography RR401, etc.

Extra Course: A course which is not a required part of a program of study but which, under certain circumstances, may be taken in addition to the regular requirements of the program of study.

Elective: A course selected by the student from several designated offerings to fulfill requirements of an approved program of study.

Failed-Credit Standing: Standing granted on the recommendation of the Faculty Board, and with the approval of the Faculty Council and the Commandant, in a failed course for the purpose of allowing a student who has failed one course to pass the year. The actual final grade earned will be recorded on the transcript with the annotation "failed-Credit" (FC), and will remain a failure for the purpose of determining whether or not work prerequisite to other courses has been completed.

Carry a Course: When so recommended by the Faculty Board and approved by the Faculty Council and the Commandant, a student carries a course — after failing this course in the previous semester or year — by taking the failed course (or an authorized equivalent) again in the first subsequent academic term or year in which the course is scheduled, together with the normal academic workload of that term or year. The grade accorded on the first attempt will be recorded on the student's transcript with the notation "Failed — but permitted to carry". The semester or year will not be cleared until the carried course has been passed. A student may not carry a course from one CMC to another.

Credit: A course at RRMC would be assigned four units of credit for a semester's work (thirteen weeks of instruction) if it corresponded to approximately one-fifth to one-sixth of a normal Canadian university academic work load in a faculty of arts and science. Most courses at RRMC carry four units of credit in a semester, some may be heavier and carry as much as six units of credit in a semester, and others may be lighter (one, two, or three units of credit in a semester).

Supplemental Examination: An examination set upon the recommendation of the Faculty Board, and with the approval of Faculty Council and the Commandant, in a course in which a student has failed. A pass in a supplemental examination may be accepted by Faculty Board to remove the deficiency of the failure. If the failed course is required to complete the work of a year, the year is failed until the supplemental examination is passed.

DURATION OF THE PROGRAM OF STUDIES

1. For students starting their studies at the Royal Military College of Canada, or at the Royal Roads Military College, the duration of the program of studies is four years of two terms or semesters each; for students starting their studies at le Collège militaire royal de Saint-Jean, it is four or five years of two terms or semesters each, depending upon whether the student enters at the first year or at the preparatory year level.
2. The years in the program of studies for students are designated as follows: preparatory year (at le Collège militaire royal de Saint-Jean only); the first, second, third, and fourth years (all three colleges).
3. Students successfully completing the second year at Royal Roads Military College and not entering a Bachelor of Science, or Bachelor of Arts program at RRMC will complete their final two years at either RMC or CMR.

DEGREES

Royal Military College of Canada

4. A degree of Bachelor of Arts, Science, or Engineering, as appropriate, shall be granted by the Royal Military College of Canada to a student who has successfully completed his final year at that institution.

Collège militaire royal de Saint-Jean

5. On the recommendation of the authorities at le Collège militaire royal de Saint-Jean, a degree of Bachelor of Arts, Science, or Administration, as appropriate, shall be granted by l'Université de Sherbrooke to a student who has successfully completed his final year at le Collège militaire royal de Saint-Jean. CMR will also, in its own name, grant a graduation certificate of academic and military qualifications to a student of that college who has earned his bachelor's degree and his commission as an officer in the Canadian Forces.

Royal Roads Military College

6. A degree of Bachelor of Science or Arts, as appropriate, shall be granted by Royal Roads Military College to a student who has successfully completed his final year at that institution.

7. A student who completes his final year with first class honours standing will have his degree script inscribed "With Distinction" (see Academic Regulations 24 and 26).

8. At the end of the second year a Certificate of Qualification may be granted by Royal Roads Military College to any student who has successfully completed the first and second years of his program of studies at that institution.

THE PROGRAMS OF STUDY

General Limitations

9. The Canadian Forces reserve the right to limit enrolment in any given program of studies at any Canadian Military College, or to select the location at which a program of studies will be offered.

All Years Royal Roads Military College

10. In the first year a student at RRMC is required to take all of the courses prescribed in the calendar under "First Year — Degrees in Arts or Administration" or "First Year — Degrees in Science or Engineering".

11. In the second year a student at RRMC is required to take all of the courses prescribed in the calendar under:

— "Second Year — Degrees in Arts or Administration";
— "Second Year — General Degree in Science";
— "Second Year — Engineering/Honours Science/Engineering Physics Degrees".

12. In the third and fourth years a student at RRMC is required to take all of the courses prescribed in the calendar under:

— "Third Year" — General and Honours Degree in Military and Strategic Studies;
— "Third Year" — General Degree in Science;
— "Third Year" — Combined Major in Physics and Computer Science;
— "Third Year" — Combined Major in Physics and Oceanography;
— "Fourth Year" — General and Honours Degree in Military and Strategic Studies;
— "Fourth Year" — General Degree in Science;
— "Fourth Year" — Combined Major in Physics and Computer Science;
— "Fourth Year" — Combined Major in Physics and Oceanography.

13. Admission into the degree programs completed at RRMC requires the satisfactory completion of second year at any CMC with the following prerequisites:

— General Degree in Science

any CMC Science or Engineering program of study which includes a course in chemistry.

— Combined Major in Physics and Oceanography

any CMC Science or Engineering program of study which includes courses in chemistry, Mathematics RR241, and Engineering RR232, or their equivalents. A weighted grade average of at least D+ is required in mathematics, science, and engineering courses.

— Combined Major in Physics and Computer Science

any CMC Science or Engineering program of study which includes a course in Chemistry, Mathematics RR241 and Mathematics RR252 or their equivalents. A weighted grade average of at least D+ is required in mathematics, science and engineering courses.

— General or Honours Degree in Military and Strategic Studies

any CMC program of studies — arts, administration, science or engineering.

HONOURS DEGREE PROGRAM

14a. Admission into the Honours Degree Program in Physics and Oceanography requires completion of "Third Year-Combined Major in Physics and Oceanography" with a weighted average of at least B+ in third year mathematics, science and engineering subjects. Students who have achieved less than second class honours may be admitted to the Honours program on a probationary basis with Faculty Council approval.

14b. Admission into the Honours Degree Program in Military and Strategic Studies requires completion of third year Military and Strategic Studies with a minimum of second class honours. Students who have achieved less than second class honours may be admitted to the Honours program on a probationary basis with Faculty Council approval.

EXTRA COURSES

15. In certain years of some programs of study a student may, with the permission of the Faculty Council, register in an extra course over and above those required for the given program of study. The grade received in such a course is counted when calculating the student's overall average and class standing.

DRILL AND PHYSICAL TRAINING

16. Courses in Drill and Physical Training must be taken by all students in all years at all colleges.

CONTINUITY OF STUDY

17. Under normal circumstances, a student at a Canadian Military College may not postpone a semester or a year of study.

CHANGES IN REGISTRATION (RRMC)

18. Any change in registration in a program of study or in a course (including an extra course) requires the permission of the Faculty Council.

19. A student may not normally transfer from one program of study to another without having completed full prerequisite standing in the courses of the program of study he wishes to enter.

ATTENDANCE

20. Students are required to attend all classes unless placed on the voluntary attendance list by the Commandant, and must attend all laboratory and tutorial sessions unless specifically excused by the instructor concerned.

21. A student who does not attend classes through illness or any other cause must complete term work and all assignments to the satisfaction of the department concerned.

RESTRICTION OF PRIVILEGES

22. A student who fails to maintain a satisfactory academic standing may be subject to such restrictions of privilege as may be recommended by the Faculty Council and approved by the Commandant.

23. A special student who fails to maintain a satisfactory academic standing in a given course may be withdrawn from that course upon the recommendation of the head of the department concerned, and the approval of the Faculty Council.

GRADES

24. Final grades in all courses will be reported as follows:

First Class Honours	(over 75%)	graded A
Second Class Honours	(66 to 74%)	graded B
Third Class Honours	(60 to 65%)	graded C
Pass	(50 to 59%)	graded D
Failure	(40 to 49%)	graded F
Serious Failure	(less than 40%)	graded FF

25. Aegrotat standing may be granted by the Faculty Council, upon the recommendation of the head of the department concerned, to any student or special student who has been unable to write one or more of the final examinations but who has achieved a satisfactory standard in the course or courses concerned.

GRADE AVERAGE AND RANK IN CLASS

26. At the end of each year a student's numerical grade average and rank in class will be calculated by adding together, for all courses taken, the product of the numerical grade in each course times the units of credit assigned to that course and dividing the sum by the total number of units of credit carried (including any extra courses). Final grades in courses are granted by the Faculty Board, subject to confirmation by the Faculty Council. Marks obtained in supplemental examinations may not be used to advance a student's academic grade average for the semester or year.

27. To be granted pass standing for a year, and to be allowed to continue into the subsequent year, a student must obtain a final grade average over the year's work of at least D. A student must obtain a final grade of at least D in each course of his program of study (other than Second Language Training courses — see description under French Department); or must successfully write supplemental examinations in failed subjects (see Academic Regulations 36, 37 and 39). However, with

the permission of the Faculty Council, a student who fails to obtain a D standing in one subject may carry that course into the subsequent year. Satisfactory progress (D or better) in Second Language Training courses is expected.

28. To be allowed to continue into the second semester of a year, a student should normally obtain a grade of at least D in each final examination written, or successfully write supplemental examinations in failed subjects (see Academic Regulations 36, 37 and 39). However, with the permission of the Faculty Council, a student who fails to obtain D standing in one subject in the first semester may carry that subject into the subsequent semester or year.

29. To complete pass standing in each semester, a student must reach a satisfactory standard in Physical Training and in Drill, and must receive a favourable report in officer-like qualities.

FINAL EXAMINATIONS

30. Final examinations in each course will be held at the end of each semester at dates and times to be specified in the examination timetable, except for courses that extend over two semesters (year courses) for which the examination at the end of the second semester is normally the final examination.

31. Students taking a year course who, at the end of the first semester, wish to transfer into a program of study for which the second semester of the year course is not required may petition the Faculty Council for permission to write a final examination in the first semester's work of the year course and to retain credit for the work thus completed.

32. A student or special student may write examinations in either English or French, except that the examinations in language courses must be written in the language concerned.

33. A student or special student may be refused permission by Faculty Council to write his final examination:

    a. in any course in which he fails to meet the requirements with regard to assignments; or

    b. in any course involving practice work in a laboratory, if this work has been unsatisfactory.

34. All instructors will submit final grades each semester in each course in which a final examination is written. In each course, the relative contribution to the final grade of class assignments, tests, laboratory work, and the final examination will be determined by the instructor concerned, in consultation with the head of the department.

35. Final grades in courses are granted by the Faculty Board, subject to confirmation by the Faculty Council.

SUPPLEMENTAL EXAMINATIONS

36. In the first semester of a year, a student may write supplemental examinations in not more than two subjects, or in not more than three subjects, providing that one of the failed subjects carries not more than one unit of credit.

37. In the second semester of a year, a student may write supplemental examinations in not more than two subjects, or in not more than three subjects, providing that one of the failed subjects carries not more than one unit of credit and that his grade average over the year's work in his program of study is D or better.

38. Supplemental examinations shall be written at dates and times to be specified by the Faculty Council and shall normally be written within three weeks of the completion of final examinations. Supplemental examinations in second language training courses are not offered.

39. To obtain pass standing in a supplemental examination, an Officer Cadet must obtain a grade of D or better, normally not including the previous term work or final examination mark.

40. Marks obtained in supplemental examinations may not be used to advance a student's academic grade average for the semester or year.

41. With the consent of the Faculty Council, and under extenuating circumstances, a special student may write a supplemental examination.

FAILURE OF A YEAR

42. A student shall fail his year if:

    a. his overall grade average for the year is less than D;

    b. he is ineligible to write supplemental examinations in failed subjects as per Academic Regulations 36 and 37;

    c. he fails a supplemental examination and is not granted failed-credit standing or is not allowed to carry a failed course; or

    d. he fails a course he has been allowed to carry.

REPEATING A YEAR

43. A student who has failed a year but who has indicated sufficient military and academic potential to succeed at a Canadian Military College may repeat the year at his own expense. Normally, a student who has failed in courses totalling as much as 50 per cent of the units of credit written in the final examinations would not be considered academically eligible to repeat. Except as noted in Regulation 44, a student permitted to repeat must repeat the entire year including any courses, or their equivalent, passed in the first attempt.

44. A student who fails his year as a result of failing his work for the first semester to the degree that he is not permitted for academic reasons to enter the second semester may be permitted to repeat the first semester at his own expense.

45. A student may repeat a year only if authorized by NDHQ on the recommendation of the Faculty Council and the Commandant.

46. A student may be permitted to repeat any year, including the fourth year.

47. A student may be permitted to repeat the second year in engineering if he has failed to qualify for engineering as required by Academic Regulations.

48. A student may repeat a year only once during his career at a Canadian Military College.

49. A student permitted to repeat a year must do so at the first opportunity.

50. A student permitted to repeat a year must carry the equivalent work load of his full program of study.

WITHDRAWAL

51. A student who fails in more than 50 per cent of the units of work written in any semester final examinations will normally be required to withdraw.

52. A student who fails a semester or year, having previously failed a semester or year, must withdraw.

53. A student who, in the opinion of the staff, fails to develop the necessary officer-like qualities will, on the approval of the Commandant, be required to withdraw.

ROYAL ROADS MILITARY COLLEGE

FORMER COMMANDANTS

		Years
Captain J.M. Grant, CBE,	RCN	1942-1946
Captain W.B. Creery, CBE, CD	RCN	1946-1948
Captain H.S. Rayner, DSC, CD	RCN	1948-1949
Group Captain J.B. Millward, DFC, CD	RCAF	1949-1952
Colonel C.B. Ware, DSO, CD	PPCLI	1952-1954
Captain J.A. Charles, OMM, CD	RCN	1954-1957
Colonel P.S. Cooper, OBE, CD	L EDMN R	1957-1960
Group Captain A.F. Avant, DSO, DFC, CD	RCAF	1960-1963
Captain W.P. Hayes, CD	RCN	1963-1965
Group Captain D.B. Wurtele, CD	RCAF	1965-1968
Colonel K.E. Lewis, CMM, CD	CF	1968-1970
Captain (N) R.C.K. Peers, CD	CF	1970-1976
Colonel J.H. Roddick, CD	CF	1976-1979

FORMER DIRECTORS OF STUDY

Commander K.G.B. Ketchum	1942-1945
Captain William Ogle	1945-1951
Professor L.A. Brown	1951-1955
Professor C.C. Cook	1955-1961

HONORARY DEGREE RECIPIENTS

1977

John Moreau Grant, Doctor of Military Science

Clennell Haggerston Dickens, Doctor of Military Science

1978

Charles Perry Stacey, Doctor of Military Science

Keith Rogers Greenaway, Doctor of Military Science

1979

Owen Connor Straun Robertson, Doctor of Military Science

Robert Thomas Duff Wallace, Doctor of Laws

John William Tranter Spinks, Doctor of Military Science

1980

George Lawson Pickard, Doctor of Military Science

Harry George DeWolf, Doctor of Military Science

1981

Henry Pybus Bell-Irving, Doctor of Military Science

1982

Louis de la Chesnaye Audette, Doctor of Military Science