Le Collège militaire royal

de

Saint-Jean

Calendar

1984-1985

CANADIAN MILITARY COLLEGE
SAINT-JEAN QUÉBEC
CANADA

1984

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THE CANADIAN MILITARY COLLEGES

There are three Military Colleges in Canada:

The Royal Military College of Canada (RMC) at Kingston, Ontario;

Royal Roads Military College (RRMC) at Victoria, British Columbia; and

Le Collège militaire royal de Saint-Jean (CMR) at Saint-Jean, Québec.

ROLE AND OBJECTIVE

The role and objective of Canadian Military Colleges is:

a. to prepare candidates 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 an understanding of the principles of biculturalism,
(4) developing a high standard of personal fitness,
(5) stimulating an awareness of the ethic of the military profession.

b. to improve the academic background of commissioned officers in the Canadian Forces by providing undergraduate and postgraduate courses in appropriate fields.

ACADEMIC OPPORTUNITIES

The Canadian Military College (CMC) program is designed to educate selected candidates to the baccalaureate level in either Computer Science, Engineering, Science, Arts or Administration. It is also designed to provide them with a well-rounded education. Thus, while the Engineering and Science programs provide specialization within certain fields of Engineering or Science, they also offer a grounding in arts. Similarly, the Arts and Administration programs offer a wide field for specialization in the humanities as well as a grounding in mathematics and sciences.

Course duration

At CMR, the courses of study are of four or five years duration depending upon whether you are accepted into first or preparatory year. All courses of study at RMC and RRMC are of four years duration.

Language training

Students will be given the opportunity to acquire the other official language since bilingualism optimizes their personal development potential. This will be achieved by an intensive compulsory second language training program during each academic year as well as during one of the summer training periods.

CMR offers its courses in both official languages; except the Military and Strategic Studies program which is offered in French only. In addition, CMR provides an institutional form of bilingualism which means that all aspects of College life and business are conducted in either official language.

RMC offers its courses in English; except for the various Engineering programs which are offered in both official languages.

Military Leadership studies

Courses in Military Leadership and Management are integrated into the academic studies. Principles of leadership from a historical perspective are integrated with concepts and practices drawn from the disciplines of psychology and sociology. Emphasis is also placed upon principles of personnel management as applied to the Canadian Forces.

MILITARY TRAINING

The primary role of the Canadian Military Colleges is to educate and train career officers for the Canadian Forces and therefore, students will undergo intensive military training during each academic year as well as during summer periods.

The military training is designed to develop those qualities essential in a good leader. It is based on the principle that "no one is fit to command who has not learned to obey" and progresses to the point where, under supervision, officer cadets of the senior year are responsible for the discipline, organization and general administration of the cadet organization. Thus, when you reach senior year, you will be able to practise and become experienced in the techniques of leadership and man management which you have been taught during your early training. This officer cadet organization gives excellent training in leadership, the acceptance of responsibility, and the proper exercise of authority; moreover, it engenders a healthy competitive spirit. Parade and ceremonial drill also form part of this training.

Service qualifications

Students will be enrolled in the Canadian Forces as an officer cadet. Consequently they will be subject to a code of behaviour consistent with regulations. A copy of the instructions which outline

the policy and procedures governing the activities of the officer cadet organisation will be issued. As part of a leadership development process, daily life will be regulated through orders and instructions which students will be expected to interpret intelligently and observe by means of self discipline.

Upon graduation, officer cadets will immediately be promoted to the commissioned rank of Second Lieutenant.

Military Career groups and classifications

Upon enrolment, officer cadets are assigned to one of five Career Groupings — Sea Operations, Land Operations, Air Operations, Engineering or Support. Thus, before making an application, you should think seriously about the selection of your future occupation as an officer. During your first academic year, you will have to make a choice of two or three officer classifications from within your career grouping. This aspect of your application is therefore very important as changes in groupings are not normally approved. It is wise to seek advice from the Military Career Counsellor at the Recruiting Centre before you agree to a career grouping. (See Figure 3 at the end of the English text.)

Armed Forces counselling

Officers from each of the five career groupings are included on the staff of the three colleges and are responsible for the military career counselling of all students. These officers are available at all times to answer queries on military matters and to offer advice on careers in the Canadian Forces.

Initial training

Entry of first year candidates into any Canadian Military College is contingent upon successful completion of a six week basic officer training course (BOTC). The aim of this course is to develop essential officer-like qualities and provide an introduction to those military subjects, the knowledge of which is essential to all officers in the Forces. First year candidates will attend BOTC in Borden, Ontario or Chilliwack, B.C. Students entering preparatory year at CMR will attend BOTC the summer following their first year of studies.

Upon arrival at the Military College, officer cadets will undergo a short orientation course designed to familiarize them with the daily routine at the college.

Training in subsequent summers

Except those entering CMR in the preparatory year, officer cadets will spend the summer following the first academic year pursuing a course of intensive language training as described earlier.

Subsequent summers will be spent in practical military training in the classification to which officer cadets have been assigned. During the summer term normal pay and allowances will be received. This term is of approximately nine week duration but varies according to classification. Upon completion of this training, annual leave may be granted prior to commencement of the next academic year.

PHYSICAL EDUCATION AND ATHLETICS

This program provides opportunities for participation in activities that are physically demanding and mentally satisfying. The athletic activities at the Colleges are designed to enable students to attain a high standard of physical fitness, to achieve a satisfactory level of sports skills, and to learn the organization and duties of officials for selected activities. This enables officer cadets to organize and run their own intramural sports program under the professional guidance of the Athletic Department. The physical education and athletic program is divided into three areas: physical education, intramural sports and intercollegiate sports.

Physical Education

Physical education is compulsory and is taken for two periods a week for the duration of students academic training. Emphasis is placed on fitness and the acquisition of basic skills in a wide variety of sports, including sports in which officers are likely to participate after graduation.

Intramural sports

The Intramural program involves a wide variety of sports and is directed to all officer cadets so that they may learn and enjoy a broad spectrum of sports activities. Participation is compulsory and even if students have never played certain sports, they will be taught how to play by qualified instructors. They will be using equipment and facilities which often are not available at civilian universities. Intramural sports are also part of the physical conditioning aspect of student's life at a CMC.

Intercollegiate sports

All popular Canadian sports are played at the intercollegiate level. These include team sports such as football, soccer, hockey, volleyball and basketball and individual sports such as judo and cross-country. Approximately 35 per cent of the students participate in this program.

Athletic activities

Badminton	Rifle
Basketball	Rugby
Broomball	Sailing
Cross-country	Skiing
Curling	Soccer
Fencing	Softball
Football	Squash
Golf	Swimming
Gymnastics	Tennis
Hockey	Triathlon
Judo	Track and Field
Lacrosse	European Handball
Pistol	Volleyball
Regatta	Waterpolo

NOTES — 1. The variety of sports varies slightly at each college and from year to year.

2. Participation in these sports is either at the intercollegiate intramural or physical education class level.

The athletic program offered at the military colleges is comprehensive, well balanced one which affords students the opportunity to participate in most major team and individual sports. A wide range of facilities, coupled with expert coaching, enables the development of abilities at progressive proficiency levels.

LIFE AT THE COLLEGES

It is a good life, but there is hard work, especially during the first year. However, there are many recreational and cultural activities available which compensate for the hard work. First year students (officer cadets) can expect to receive limited privileges, especially prior to Christmas, but then, in the second, third and fourth years they will be given additional privileges which correspond to increased responsibilities. A unique spirit of comradeship develops among fellow officer cadets and out of this comradeship comes lifelong friendship.

Weekday routine

Although the program of academic, military, athletic and recreational activities is more demanding, more comprehensive and far more exacting than at any other university, a scheduled daily routine provides time for both recreation and study.

The typical daily routine on weekdays is as follows:

6:30	Reveille
6:35 — 7:20	Wash, Shave, Dress Defaulters Parade Room Inspections
7:20 — 7:45	Breakfast
8:00 — 12:00	Classes
12:00 — 13:00	Lunch
13:00 — 16:00	Classes
16:00 — 18:00	Sports (Mon-Tue-Thu) Cultural — non-athletic recreation (Wed)
18:00 — 19:00	Dinner
19:00 — 22:00	Study Period
23:00	Lights Out for Recruits

On weekends, drill parades and ceremonial practices are sometimes held on Saturday morning and a Commandant's parade is held on one Sunday morning each month. (Frequency varies at each college). The remainder of the weekend is normally free. During examinations, most non-academic activities are suspended, although students are expected to get daily exercise.

Officer Cadet Organization

Students at each College are organized into a Cadet Wing composed of a headquarters and several squadrons which in turn are subdivided into flights and sections. Students of the senior classes (at CMR, students of the last three years) hold appointments from Wing Commander to Section Commander and receive practical training in leadership by being responsible for the discipline, progress and efficiency of their wing, squadron, flight or section. This combination of university and military life provides an unparalleled opportunity to practice the leadership and management techniques that are studied in the classroom.

Activities

Although participating in the physical education and sports program, students are also encouraged to participate in other recreational, cultural and extra curricular activities at the College. These activities are, for the most part, organized and run by the students themselves.

Cultural organizations

A large number of clubs provide outlets for students special interests: art, ceramics, chess, debating, drama, photography, war games, Canadian Aeronautical Space Institute, international relations, and the Engineering Society. Other organizations such as Le Cercle Chabot (French Club), the Music Club (records and record players), the Electronics Club (including short wave stations) and the Entertainment Committee (for dances and other activities), and the production of monthly newspapers and college Year Books will give you experience in management. Student participation is sponsored in national and international gatherings, various university-conducted forums, etc. Religious clubs such as the Newman Club and Iota Sigma are also active. Although some of the listed clubs are active at only one College, most are run in all three Colleges, depending upon interest.

Recreation

Athletic clubs are organized for those officer cadets interested in sky or scuba diving, mountaineering, orienteering and flying. Opportunities are also provided for students to ski, skate, curl, play golf or tennis, sail, hunt and fish. The reading rooms and libraries also provide recreational facilities.

Social

All Colleges enjoy frequent formal and informal social events during the academic year. These functions are also organized and run by the students. Each college also has officer cadet lounge which provides facilities for relaxation as well as introducing you to the customs and practices of a military mess.

Religion

The Chaplains — Protestant and Roman Catholic — conduct regular Sunday Services of Divine Worship. Students are encouraged to attend church regularly, and are required to attend on occasions specified by the Commandant. The Chaplains are always available for counselling.

The Ex-Cadet Clubs

All those who have attended a Canadian Military College are eligible to become a member of either the RMC Club of Canada or the CMR Ex-Cadet Club — the alumni of the Canadian Military Colleges. As a member of these Clubs, graduates retain a valuable connection with the Colleges. In addition, no matter where duties and responsibilities take fellow classmen, later on their paths will cross many times thereby enabling them to renew the friendships they have made at College.

GENERAL INFORMATION

ADMISSION PLANS

There are two alternate plans for admission: the Regular Officer Training Plan (ROTP) and the Reserve Entry Training Plan (RETP).

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, especially in the operational and technical fields. The ROTP was introduced to provide the principle source of such highly qualified officers for the Canadian Forces. The plan gives young Canadians the opportunity to obtain both a university education and a commission as an officer in the Canadian Forces. If accepted for entry at a Canadian Military College, candidates are enrolled in the regular component of the Canadian Forces as an officer cadet.

The cost of tuition, uniforms, books, instruments, and other essential fees for the duration of the course of studies will be borne by the Department of National Defence. In addition, officer cadets are paid a monthly allowance, with annual increases. This allowance comes as a salary with monthly deductions for income tax, supplementary death benefits, pension plan, rations, and quarters. Free medical and dental care is provided through the entire training period. Annual leave with pay is granted according to regulations.

Officer cadets are obliged to maintain a satisfactory academic and military standard throughout their course. Should they fail a year at college (or a term, if at CMR) they may, on the recommendation of the college, be permitted to repeat a year or term at their own expense and, if successful, be reinstated to full pay and allowances.

Upon successful completion of the course, students will be awarded a degree from a Canadian Military College (at CMR, from the Université de Sherbrooke) and a commission as an officer, beginning a career in the Canadian Forces.

At CMR Preparatory year and new first year officer cadets may request to be released without obligation on their part. Such release requests will only be entertained at the following times during the academic year:

(1) on the lst of November;
(2) between the end of the first term final exams and the beginning of the second term; and
(3) between the end of the second term final exams and the beginning of the second academic year.

An officer cadet may be granted a voluntary release after the beginning of his second academic year, provided the Crown is repaid the cost of subsidization under the ROTP. Release within four years after graduation (five years if aircrew) will be considered only under

special and unforeseen circumstances. Release in such circumstances may be subject to reimbursement of all or part of the cost of subsidization.

Admission to civilian university

Some candidates who are not accepted at a Canadian Military College because of space limitations or because they do not possess the full academic requirements may be selected for ROTP sponsorship at a recognized post-secondary institution under the terms of the ROTP.

Reserve Entry Training Plan (RETP)

Students who wish to have military training along with their education but are not yet prepared to commit themselves to a career in the Regular Forces at the time of entry, should consider the RETP program.

The Canadian Military Colleges provide vacancies for Reserve entry officer cadets. Admission requirements are the same as those for ROTP applicants. Students receive the same education and training as the ROTP officer cadets but are required to pay fees to defray the cost of tuition, clothing, books, instruments, laundry, dry cleaning, meals and accommodation according to the scale of fees mentioned below. They are also required to take summer classification training for which they receive pay and allowances at the same rate as a Second Lieutenant on Class B service.

Students may transfer to the ROTP at any time during their College course, in which event, they pay no further fees and they receive the same financial benefits as the ROTP officer cadet. If they elect to remain a Reserve entry officer cadet, they will be required to serve in a component of the Canadian Reserve Forces upon graduation.

Fees (Reserve Entry Officer Cadets only)

The following fees apply to all officer cadets with reserve status:

a. $400.00 each term for tuition, clothing, books, instruments, drawing materials and incidental expenses;

b. approximately $875.00 per term to defray the cost of meals and accomodation;

c. an annual Recreation Club Fee of $60.00; and

d. a deposit account of $100.00 to be paid on admission to the initial year to cover losses, breakages and additional expenditures. Each subsequent year a sum sufficient to restore this account to $100.00. The balance remaining in a cadet's deposit account will be refunded at the time of graduation or release.

NOTE — All fees quoted will be revised periodically and current costs should be obtained from the nearest recruiting centre.

Information

Complete information on the ROTP or the RETP can be obtained from the Director of Recruiting and Selection, National Defence Headquarters, Ottawa, Ontario, K1A 0K2; from any Canadian Forces Recruiting listed in the yellow pages under "Recruiting", or from the Registrar at one of the Canadian Military Colleges:

Collège militaire royal de Saint-Jean,
Richelain, Québec J0J 1R0
Tel. 514-346-2131

The Royal Military College of Canada,
Kingston, Ontario K7L 2W3
Tel. 613-545-7302

Royal Roads Military College, Victoria,
British Columbia V0S 1B0
Tel. 604-388-2251

ADMISSION REQUIREMENTS

General qualifications

Admission requirements for ROTP and RETP entry are the same. As a candidate for admission, you must:

a. Be a Canadian citizen.

b. Have preferably reached your 16th birthday on or before January 1st of the year of your enrolment.

c. For entry to RMC, RRMC or first year at CMR, you must be preferably under 21 years of age on January 1st of the year of your enrolment.

d. For entry to the preparatory year at CMR, you must be preferably under 20 years of age on January 1st of the year of your enrolment.

e. Meet the medical standards for enrolment as prescribed.

f. Obtain a passing standing in a series of pre-enrolment tests as prescribed.

g. Be single.

h. Possess the necessary academic qualifications.

Physical requirements

Candidates are required to meet the common enrolment standards of the Canadian Forces. The fundamental medical requirement is a sound, healthy body with normal mental and muscular co-ordination. Particular attention is given to the cardiovascular system, the respiratory system, central nervous system, visual acuity, colour vision, eye muscle balance, organs of speech and hearing acuity. Any condition which, in its present state, or in a more advanced state, could limit your career as a member of the Canadian Forces will be cause for rejection. You should be prepared to participate fully in a vigorous, progressive physical training program.

Further information on physical requirements may be obtained from a military career counsellor at your nearest Canadian Forces Recruiting Centre.

Requirements

To meet the minimum requirements for admission to any of the three CMC's candidates must present satisfactory marks as well as having matriculated at the level designated below:

	CMR — Prep Year Junior Matriculation	RMC, RRMC and CMR Senior Matriculation
Nfld	Grade X1	lst year university, or equivalent
P.E.I.	Grade X1	Grade XII
Nova Scotia	Grade X1	Grade X11
N.B.	according to dossier	Grade X11*
Québec	High School Leaving (X1) Secondaire V**	CEGEP 1 or equivalent***
Ontario	Grade X11	Grade X111
Manitoba	Grade X1	Grade X11
Sask.	Grade X1	Grade X11
Alberta	Grade X1	Grade X11
B.C.	Grade X1	Grade X11

In the light of the course requirements at the Military Colleges, mathematics/science averages in high school will be an important criterion in the selection process.

University certificates of academic standing and high school graduation diplomas from other recognized examining bodies will be assessed and accepted in so far as they meet the prescribed entrance requirements.

* Specific subjects offered for CMR admission must be at the 121 or 122 level, with 121 level courses preferred.

** See academic requirements for preparatory year, page 34.

*** 14 courses (See: Outline of Courses — Preparatory Year), page 49).

GENERAL INFORMATION

Admission Procedure

Application forms may be completed at either a Canadian Forces Recruiting Centre (CFRC) or a mobile recruiting office. Your birth certificate and a report of educational achievement should be submitted.

Application date

Application should be made as early as possible in your final year of high school preferably before March 1st of the year in which you seek admission. Your academic record should be completed with information that is up to date at the time of application, after which school marks should be sent to the Recruiting Centre as soon as possible after they are received in order to ensure rapid processing of your application.

If you are applying for the Canadian Military Colleges, you are urged to submit an application to other universities or colleges in addition so that you will not be denied the opportunity of continuing to university or college in the event that you are not selected for the Canadian Military Colleges. However, evidence of admission to a Canadian University or college is not required for consideration for a place at a CMC.

Selection procedure

Eligible applicants for the ROTP or RETP will be required to appear, by appointment, at a Canadian Forces Recruiting Centre (CRFC) for a medical examination, testing and an interview at a convenient time after the date of their application. Within Canada, applicants not residents of the city within which the CFRC is located, will normally 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.

You will be advised shortly after your interview as to the status of your application. You will be considered for admission to the Military College of your first choice, provided there is a vacancy at that College, and that you meet the appropriate minimum admission requirements. Otherwise, you may be considered for entry at another Military College or a recognized civilian post secondary institution.

Final selection is based on academic standing and on the recommendations of the Interview and Medical Boards and is made by the Final Board of Selection. Selection is competitive on the basis of merit, and, possession of the minimum admission requirements does not give assurance of acceptance.

Joining instructions

As soon as the decision of the Final Board of Selection is made known, successful applicants will be informed of the date of posting to the BOTC, when they must report to their CMC, of the procedures to be followed, and of the clothing and equipment they should bring with them. They also will be given instructions about transportation and travelling allowances.

UNIVERSITY TRAINING PLAN — OFFICERS (UTPO)

Officers of the Regular Force who are candidates for the University Training Plan -- Officers (UTPO) may be selected to attend Le Collège militaire royal de Saint-Jean, the Royal Military College of Canada, or the Royal Roads Military College, in accordance with the rules and procedures set forth in CFAO 9-40, University Training Plan — Officers.

According to this order, candidates must be able to obtain a bachelor's degree within a period of two years or less (four terms). Programs of studies which are offered are described in the College Calendars. Any request for information of a strictly academic nature concerning admission to CMR or RMC under the UTPO, should be addressed to the College registrars.

UNIVERSITY TRAINING PLAN — OTHER RANKS (UTPOR)

Men and women of the Regular Force who apply for enrolment under the University Training Plan -- Other Ranks (UTPOR) may be selected to attend Le Collège militaire royal de Saint-Jean, the Royal Military College of Canada, or the Royal Roads Military College, in accordance with the policy and administrative procedures set forth in CFAO 9-13, University Training Plan — Men.

Candidates must meet the educational requirements set by the College authorities. Duration of their studies may vary according to the level and quality of their academic background.

Any request for information concerning admission to the Colleges under this program must be addressed to the Registrars.

SCHOLARSHIPS, BURSARIES AND DOMINION CADETSHIPS

Scholarships and Bursaries

Regular Officer Training Plan

Scholarships awarded in recognition of academic merit may be retained under the ROTP.

Reserve Entry Plan

Applicants under the Reserve Entry Plan may be eligible for a number of scholarships and bursaries that are available to students at Canadian universities. Further information may be obtained from the college Registrars.

Dominion Cadetships

A Dominion Cadetship may be granted by the Minister of National Defence to a cadet who, being a member of the Reserve Force, enters the initial year at a Canadian Military College:

(a) The value of a Dominion Cadetship shall encompass —

  (1) the annual college fee for the first year,

  (2) 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.

(b) Not more than 15 Dominion Cadetships may be granted in a college year.

(c) 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.

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

(e) The final Board of Selection shall submit to the Minister of National Defence for approval a list of candidates recommended for Dominion Cadetships, in order of merit.

(f) A Dominion Cadetship is forfeited on failure of an academic year.

Royal Military College Club of Canada Foundation Scholarship

Scholarships annually are open to competition among all Reserve Entry applicants for admission to the Canadian Military colleges. Each scholarship has a value of $1000.00. An applicant, to be awarded a scholarship, must be an accepted Reserve Entry candidate for Royal Military College of Canada, Kingston, Ontario; Royal Roads, Victoria, B.C.; or Le Collège militaire royal de Saint-Jean, Saint-Jean (Québec). Further information may be obtained from the Secretary-Treasurer, RMC Club of Canada, Royal Military College of Canada, Kingston, Ontario.

COLLÈGE MILITAIRE ROYAL DE SAINT-JEAN

ACADEMIC YEAR 1984-1985

First term

Aug	11	Sat	Recruits arrive.
Aug	26	Sat	Students return.
Aug	27	Mon	Classes start.
Sep	3	Mon	Labour Day: Holiday.
Sep	30	Sun	Fall Prize Giving ceremonies.
Oct	8	Mon	Thanksgiving: Holiday.
Nov	12	Fri	Remembrance Day: Holiday.
Dec	7	Fri	Classes end.
Dec	10	Mon	Exams start.
Dec	19	Wed	Exams end.
Dec	21	Fri	Faculty Board/Faculty Council (Study of Marks).
Dec	22-Jan 9	Sat-Wed	Christmas Leave.
Jan	7-9	Mon-Wed	Supplemental Examinations.
Jan	9	Wed	Faculty Council (Study of Marks).

Second Term

Jan	9	Wed	Students return.
Jan	10	Thurs	Classes start.
Feb	15-16	Fri-Sat	Carnival: Holiday.
Apr	5-8	Fri-Mon	Easter: Holiday.
Apr	26	Fri	Classes end.
Apr	29	Mon	Exams start.
May	8	Wed	Exams end.
May	10	Fri	Faculty Board/Faculty Council (Study of Marks).
May	14-16	Tues-Thurs	Supplemental Examinations.
May	17	Fri	Faculty Council (Study of Marks).
May	18	Sat	End of Year Ceremonies and Graduation Ball.

COLLEGE COUNCIL

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CD, ADC, BSc(RMC),
Commandant.

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CD, NDC, BSc, MSC, PhD(Montréal),
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Lieutenant-Colonel J.D.Y. Lafrance,
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Director of Cadets.

Major M. Langlais,
CD,
Director of Administration.

Dr. J. Castonguay,
BA(Laval), Bth, LPh, LTh(Rome, DPh(Montréal),
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Secretary

Prof. J.-M. Jarry,
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Registrar.

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Minister of National Defence

Commandant

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ACADEMIC WING

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Assistant Registrar and Academic Advisor.

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GRETCHEN HUGHES CHEUNG,
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Audio-Visual Resources Centre

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Director.

Computing Services Centre

MAJOR N.E. LEE,
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A. BÉLANGER,
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Analyst-Programmer.

M. SCHMIDT,
Honeywell Senior-Analyst.

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Honeywell Analyst.

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Honeywell Programmer/Operator.

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MILITARY WING

Director of Cadets

Lieutenant-Colonel J.D.Y. Lafrance
CD, plsc, BA(RMC)

Staff Officers

Training: Major G. Babkine, CD, psc, BA(RMC)
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Projects and Bilingualism Development: Lieutenant-Commander
G.L. Rathwell, BSc(McGill)

Squadron Commanders

Vaudreuil (No. 1) Squadron
Captain C.D. Moore.

Tracy (No. 2) Squadron
Captain N.J.H. Ducrocq, BPD

Jolliet (No. 3) Squadron
Captain J.Y.R. Côté, BAS.

Hudson (No. 4) Squadron
Captain J.R. Bélanger, CD.

Iberville (No. 5) Squadron
Lieutenant (N) G.A. Hunt,BAdm(CMR).

Preston (No. 6) Squadron
Captain J.A.G.R. Falardeau, BSc(CMR)

Montcalm (No. 7) Squadron
CAPT J.J.C. Girard, CD.

St-Laurent (No. 8) Squadron
Lieutenant-Commander G.L. Rathwell, BSc(McGill)

Physical Education and Sports

Director of Athletics
Major H.R. Helgason, BPE

Assistant Director of Athletics
Captain J.A.J.M. Caron, BAdm(CMR).

Recreation Coordinator
Captain F.R. Folkmann, BPE

Chief Instructor
Warrant Officer M.L. Boudreau, CD.

University Liaison Officers

Captain J.R.A. Voyer, CD.
Captain (W) M.C.Y.M. Pélissier, BEd, BA.

Military Training and Drill

Chief Instructor and Regimental Sergeant-Major,
Chief Warrant Officer J.E.C. Gagnon, MMM, CD.

Instructors

Master Warrant Officer J.J.M. Dessureault, CD
Sergeant J.L.M. Jacques, CD
Sergeant J.A.M. Rioux

ADMINISTRATIVE WING

MAJOR M.R.M. LANGLAIS
CD
Director of Administration

CAPTAIN J.R.J. BELAND
CD, AA(Maryland)
Staff Officer - Personnel

CAPTAIN J.Y.A. RIOUX
CD
Staff Officer - Logistics

CAPTAIN J.J.J. PROVENCAL
CD
Food Services Officer

CAPTAIN J.-M. GAGNE
BA, BTh(Laval)
Roman Catholic Chaplain

CAPTAIN W.G. SHIELDS
CD, BA(Bishops), MDiv(Trinity)
Protestant Chaplain

CAPTAIN J.E.L. PELLETIER
BSc(Nutrition), DDS(Laval)
Dental Officer

V. PERRON
Civilian Personnel Officer

MASTER WARRANT OFFICER M.G.A.D. MERCIER
CD
Chief Clerk

GENERAL

History and Location of the College

CMR is located on the west bank of the Richelieu River on the southern fringe of the town of Saint-Jean in Québec's Richelieu Valley. The original buildings, still in use at CMR, were built around 1839 and were used by various military units which occupied Fort Saint-Jean. Since the opening of the College in 1952, many new facilities have been added.

The site selected for CMR was historically right for this bilingual institution. Fort Saint-Jean having been closely connected with the history of Canada. Throughout the French regime, the Fort helped maintain the advanced posts guarding the invasion route formed by Lake Champlain and the Richelieu. In the fall of 1775, during the American Revolution, Fort Saint-Jean withstood General Montgomery's siege for 45 days, delaying him to the point that his assault on Québec was severely hampered by the onset of winter and ended in complete failure. The defence of the Fort is a glorious page in our history, not only because of its heroic character, but also because it was the first time English-speaking and French-speaking Canadian soldiers were united in a common cause.

The opening of CMR in 1952 offered French-speaking candidates equal opportunity for a military career by providing a Military College education in their mother tongue. CMR provides a pre-university year of study, which enables the College to admit graduates of secondary schools with junior matriculation. Above all, CMR was established as a bilingual college where young Canadians take courses in their mother tongue (French or English) and learn the other official language.

Approximately 550 Officer Cadets are in residence at CMR, of whom 250 are in preparatory year.

Degree Programs Offered

CMR offers five-year courses beyond junior matriculation leading to the following degrees:

BAdm
BSc
BA

Certain degree courses may require that the student's final two years be completed at a different Canadian Military College.

Preparatory year students

If you have completed junior matriculation (but not a senior matriculation), you will enter preparatory year. The Board of Admission of CMR may admit you into first year on the strength of your academic record, but you may be called upon to write examinations in order to establish your admissibility.

As a preparatory year student you take courses in your Mother Tongue (Français or English); a Second Language (Anglais or French); History; Economics; Philosophy; Mathematics; Chemistry; Physics; Physical Education and Military Drill.

Academic requirements for preparatory year

Candidates must have completed their junior matriculation. In addition, specific academic requirements for preparatory year at CMR include the following:

Quebec Applicants*	All Other Applicants
Français or English (mother tongue)	Français or English (mother tongue)
Mathematics (Series 500)	Physics
Physics (Series 400 or 500)	Chemistry
Chemistry (Series 400 or 500)	Mathematics (algebra, geometry and trigonometry or relations and functions)

The Faculty Council

The Faculty Council is composed of the Principal and Director of Studies as Chairman, the Director of Cadets, the Deans, the Registrar as Secretary, and the Heads of academic departments as members. The function of the Council is to determine on all matters of an educational character, to foster and encourage Faculty participation in Research in order to sustain academic excellence (Research with a Defence focus is encouraged), and generally to make recommendations to the Commandant for promoting the interest of the College.

The Faculty Board

The Faculty Board is composed of the Principal and Director of Studies or his representative as Chairman, the Director of Cadets, the Director of Administration, the Registrar as Secretary, all the members of the teaching staff, the Assistant Registrar, the officers of the Military Wing and the Director of Physical Training and Athletics. The function of the Faculty Board is to make recommendations to the Commandant through the Faculty Council on examination results, honours standing, failure, cadet appointments, to exercise academic supervision over officer cadets, and to make

recommendations to the Commandant through the Faculty Council for promoting the academic interests of the College.

Library

The Library contains approximately 150,000 books, pamphlets, periodicals, and government publications. The collection is growing at the rate of 5,000 books per year and the Library subscribes to some 800 periodicals. In addition to the printed material, the Library has a collection of 2,500 reels of microfilms and approximately 1,900 slides. The Library collection deals with various topics, but covers particularly the following academic subjects: administration, social sciences, physics, chemistry, mathematics, engineering, strategic studies, psychology, and English and French literature.

Since November 1972, the new library has carrels, small study rooms, and seminar rooms. The Library facilities are extended to the officer cadets, professors, and other members of the college staff.

During the academic session, the Library is open, Monday to Friday, from 08:00 to 16:30 and 19:00 to 22:00 hours, on Saturdays and Sundays, from 13:00 to 17:00 and 19:00 to 22:00 hours.

Computing Services Centre (CSC)

The Computing Services Centre operates a Honeywell dual DPS 8/52C mainframe computer. Its operating system, Control Program 6 (CP6), manages a main memory of 12 millions characters (bytes), secondary disk storage of 1.3 billion characters and two front end communication processors handling presently 60 concurrent on-line users in time-sharing mode.

All current programming languages are available on this system. The students and faculty members use FORTRAN 77, COBOL, PASCAL and APL regularly within the course curriculum. The system offers a library of subprograms and application programs in the area of simulation, statisical analysis, linear programming, and advanced mathematical analysis.

A computer graphics laboratory tied in to the central computer offers eight high resolution Tektronix terminals, hard copy units and a Calcomp 30-inch drum plotter.

In addition the Centre operates a PDP 11/34 for administrative tasks and dedicated research or student use. A laboratory of 15 microcomputers is available to students and faculty for course support and research.

Access to the computing facility is available 24 hours a day. It is used extensively by the students in their computer courses as well as in other courses where it has become an invaluable tool.

Access to the computing facilities is available 24 hours a day and is being used extensively by the students in their computer courses as well as in other courses where it becomes an invaluable tool.

Audio-Visual Resource Centre (AVRC)

The AVRC offers to College personnel, the audio-visual means and techniques required for teaching, military and athletic education, and research. The AVRC has five members and includes the following sections:

a. production and diffusion services: language laboratories, (with micro-processors), mini television studio, draughting laboratory, and rooms for edition and teaching;

b. audio-visual equipment loan and maintenance services;

c. service for the purchasing, classification, and loan of audio-visual documents;

d. research services which look after the organization of research in the pedagogical field; and

e. service for the information, organization and animation of different pedagogical activities as well as the short and long term planning of the pedagogical requirements.

The AVRC is also available to help the students in the use of audio-visual material as a learning device, and as a pedagogical tool which could support the presentation of their written projects or research. It also provides equipment for the CMR — Audio-visual club and the Photography club, and advises them on the use of audio-visual equipment in their respective ativities.

The AVRC is located on the south-east wing of the third floor of De Lery Hall.

Medals and Prizes

All awards in which studies, academic standing, or academic proficiency is a qualification normally require that the year must have been clearly passed at the first attempt without conditions and with at least second class standing.

The following annual awards may be won by students who meet the requirements as specified by the donors or as determined by the Faculty Council and approved by the Commandant.

MEDALS

The Governor-General's Gold Medal, awarded to the student with the highest academic standing in the fourth year.

The Governor-General's Silver Medal, awarded to the student with the highest academic standing in the second year.

The Governor-General's Bronze Medal, awarded to the student with the highest academic standing in the first year.

The Ex-Cadet Club Medals, awarded to the students of the first year who have made the most progress in their second language.

SWORD OF HONOUR

This prize is awarded by the Department of National Defence to the fourth year student who best combines high standards of proficiency in each of the academic, military, and sports aspects of his training.

UTPOR SILVER TRAY

The UTPOR Silver Tray is awarded to the student in the University Training Program — Other Ranks — who achieved highest all-around proficiency.

ROBERT GERVAIS AWARD

The Robert Gervais Trophy, presented by the UTPOR Graduating Class of 1981, is awarded to the outstanding CMR new intake UTPOR student.

PROFICIENCY PRIZE

This prize is awarded to the student who has achieved the highest overall standing in all subjects in his program of study.

DEPARTMENTAL PRIZES

A departmental prize is awarded annually to the cadet who has achieved the highest standing in the several courses of a department provided that he has passed his year without conditions and has obtained First Class Honours in these courses.

THE SHIELD OF HONOUR

The Shield of Honour presented by the ex-CMR Cadet Club is awarded to the graduate cadet who, by his altruism towards his fellow students and his degree of interest and involvement most contributed to life at the College.

OTHER AWARDS

Several other prizes and awards are presented to students who distinguish themselves in specific athletics or military activities.

Fort Saint-Jean Museum

The Fort Saint-Jean Museum is located in the old guardhouse built around 1850. It is open to the public from May 27th to August 21st from 9:30 a.m. to 4 p.m.

The objective of the Museum is to perpetuate the memory of Fort Saint-Jean and to remind the officer cadets of the heritage of their College, thus giving them a certain pride in the past. Recognized as an official museum by the Canadian Forces it is advantageously located in the vicinity of other historic sites, such as Fort Chambly and Fort Lennox.

The Museum's display is centered around its theme, that is the history of Fort Saint-Jean from 1666 to the present day. To accomplish this, the exhibits are divided into six periods: two dealing with Fort Saint-Jean in the hands of the French; two dealing with the English Fort Saint-Jean; one depicting the Canadian Fort; and the last one dealing with one of the Canadian Military Colleges, Le Collège militaire royal de Saint-Jean.

COURSE OUTLINES

Distribution of Work

After the name of each course, there are three digits separated by dashes; for instance.

3-1-5

This series of digits indicates how the weekly work is distributed in each particular course. The first digit shows the number of periods allotted to theory, the second digit determines the number of periods spent in laboratory work of practical exercises, and third digit, the recommended number of periods to be spent for personal assignment.

Duration of the Programs of Study

1. The duration of the programs of studies is normally four or five academic years. The years are designated as follows: preparatory year and first year (College level), second year, third year and fourth year (University level).

2. Entrance to the preparatory year requires completion of junior matriculation or its equivalent. Entrance to the first year requires completion of a course equivalent to the preparatory year course of studies.

Choice of Programs of Study

1. COMPUTING SCIENCE AT CMR (BSc)

The general objective of this programme is to prepare officers in the different fields of Computing Science which are of interest to the Canadian Forces. Because of the diversity of classification requirements, the programmes are of a broad nature.

The following concentrations are available: Systems, Management, Physics and Mathematics.

a. The objective of the Systems concentration is to impart to the students the hardware and software knowledge required to operate efficiently in an environment strongly oriented towards computerized ans automated systems.

b. The goal in the Management concentration is to impart to the student a good knowledge of modern management techniques and to give him the capability of making his science serve these techniques.

c. The objective of the Physics concentration is to provide the student with a fundamental background in Computing Science (particularly in software) completed by a good knowledge of Physics in general, and more specifically of the Physics related to computers.

d. The goal of the Mathematics concentration is to provide the student with the fundamental background in Mathematics and Computing Science which will enable him to use the most modern techniques in tackling the numerous logistics and tactics problems which are encountered in the different classifications of the Canadian Forces. To familiarize the student with the components of a modern computerized system of defence.

2. PHYSICAL SCIENCES AT CMR (BSc)

The physical sciences options at CMR are designed to impart a full appreciation of quantitative and analytical methods. They encourage and simulate a critical analysis of cause and effect, a demand for precision, and a powerful curiosity. With the increasing influence of scientific progress in the Canadian Forces, the general objective of these programs includes the preparation of the student to perform in a professional environment in the Canadian Forces.

The following programs are available:

a. Bachelor of Science with Honours in Physics.

This most demanding program emphasizes fundamental physical principles. The particular objective of this program is to form modern physicists and prepare them for post-graduate studies. This program is intended for students who have prime interest in physics and have results that are above average.

b. Bachelor of Science with Major in Physics and Minor in Mathematics.

Principles and applications of physics and mathematics are stressed in this program. It is intended for students with strong scientific and technological interests who have demonstrated at least an average achievement in previous science course.

c. Bachelor of Science (General).

The particular objective of this program is to procure a modern scientific university formation in offering the possibility to stress personal interests by a choice of courses. It is intended for students who have succeeded a second year program in Sciences or Engineering.

3. ADMINISTRATION OPTION AT CMR (BAdm)

Major Objective — The main purpose of the program leading to the degree of Bachelor of Administration, is to provide opportunity for the development of efficient administrators capable of adapting to different types of organizations.

Secondary Objectives — 1) To provide the student with a broad background in Business Administration. 2) To improve the understanding

of human behaviour in connection with administration problems. 3) To provide the future officer with a fair knowledge of Public Administration which will enable him to be an effective manager in the Canadian Forces. 4) To provide the future manager with the knowledge which will permit utilization of quantitative methods in his decision making.

Methods of Instruction — Many approaches to learning are used: case method, role playing, films, lectures, reading, report writing, business games, classroom discussions, tours of industry, and simulation exercises. Students are also called upon to apply experiential methods in organizations outside the college.

4. MILITARY AND STRATEGIC STUDIES AT CMR (BA)

This course has attracted wide attention in at least three areas: military, university and professional.

Following a progressive evolution from first through the second year, the program terminates by an in-depth study during the third and fourth years.

The unique inter-disciplinary character of the B.A. in Military and Strategic Studies is evident. Courses include Military History, Science of War, International Relations, Defence Policy, Social and Administration Science, Arts, Chemistry, Physics, Mathematics and Psychology.

In addition to allowing the student to move from one military college to another, this programme supplies him with a solid foundation for post-graduate studies and for a professional career with unlimited possibilities.

5. CANADIAN STUDIES AT CMR (BA)
(MINOR: ADMINISTRATION)

Primary objective — The Canadian Studies Program is being offered in conjunction with various departments to give the officer cadet an opportunity to gain a fairly comprehensive understanding of the Canadian civilization as a living culture.

Secondary objectives — 1) The Canadian Studies Program is designed to provide the future officer with a better understanding of his fellow-countrymen for whom and with whom he will be required to work. 2) To provide the student with a university education which will enable him to be an effective young officer in the Canadian Forces. 3) To offer the officer cadet the possibility of earning a BA degree in relation with his aptitudes and interests.

Methods of study — 1) The field method: students have the opportunity to experience CMR and the Montréal area as a microcosm of the Canadian reality and the interface of the three

major components of our society. 2) Content analysis method: the qualitative and quantitative study in a systematic way; through history, literature, arts and institutions etc of the values, beliefs and norms of the Canadian. 3) Cross-cultural method: the study of the English and French Canadian Cultures - their similarities and differences.

Conditions for Admission into Courses of Study in Computing Science at CMR

1. BSc in Computing Science: Systems Concentration

As a general rule, students from the three Canadian Military Colleges, who have successfully completed the second Year of a Science or Engineering course are admitted provided that they have taken MAT 212, MAT 251 or the equivalent, and have obtained 60 per cent general average. Admission to the course is always subject to approval by the Chairman of the department involved and must be sanctioned by the Dean of the Division concerned.

2. BSc in Computing Science (Management, Physics or Mathematics Concentration)

As a general rule, students from the three Canadian Military Colleges, who have successfully completed the second year of a Science or Engineering course are admitted to the Management, Physics or Mathematics concentrations provided that they have taken MAT 212, MAT 251 or the equivalent, and have obtained a 55 per cent general average. Admission to these courses is always subjected to approval by the Chairman of the department involved and must be sanctioned by the Dean of the Division concerned.

Conditions for Admission into Courses of Study in Physical Sciences at CMR

1. BSc with Honors in Physics

Entry will normally be open to candidates from the three Canadian Military Colleges who have successfully completed the second year of a Science or Engineering program, provided that they have taken, in second year, MAT 212, MAT 251 or the equivalent, and have obtained a minimum combined average of 66 per cent in mathematics and physics and an overall average of at least 60 per cent. Entry to this Honours program is subject to the approval of the Mathematics and Physics Departments at CMR and must be sanctioned by the Dean of the Division concerned.

2. BSc with Major in Physics and Minor in Mathematics

Entry will normally be open to those candidates who have successfully completed the second year in a Science or Engineering program of study at RMC, RRMC, or CMR, provided that they have

taken MATR212, MAT251 or the equivalent, and have obtained a minimum combined average of 55 per cent in mathematics and physics.

3. Bsc (General)

Entry will normally be open to those candidates who have completed the second year in any of the Science or Engineering programs of study at RMC, RRMC, or CMR.

Conditions for Admission Into Course of Study in Administration at CMR

1. Entry will normally be open to those candidates from RMC and RRMC who have completed their second year in Arts and preferably to those who have taken CO 304 Principles of Accounting. Other candidates from other options may be accepted subject to a special review of their academic records.

The following compensative courses must be taken at CMR:

ADM 231: Accounting I (If CO 304 not taken in second year)
ADM 232: Accounting II
ADM 241: Managerial Mathematics
SCH 212: Microeconomic Analysis

2. Students from CMR

Entry will normally be open to those candidates who have completed their second year in Administration.

Conditions for Admission into Course of Study in Canadian Studies at CMR

1. Students from RMC and RRMC

Entry will normally be open to those candidates who have completed their Second Year in Arts and preferably to those who have taken CO 304 Principles of Accounting, or RR 203 Commerce (one semester course). Other candidates from other options may be accepted subject to a special review of their academic records.

2. Students from CMR

Entry will normally be open to those candidates who have completed their second year in Canadian Studies. Other candidates from other options may be accepted subject to a special review of their academic records.

Conditions for Admission into Course of Study in Military and Strategic Studies at CMR

1. Students from RMC and RRMC

Entry will normally be open to those candidates from RMC and RRMC who have completed their second year in Arts. Other candidates from other options may be accepted subject to a special review of their academic records.

2. Students from CMR

Entry will normally be open to those candidates who have completed their second year in Military and Strategic Studies.

CONDITIONS FOR TRANSFER FROM THE OTHER CANADIAN MILITARY COLLEGES INTO THIRD YEAR DEGREE COURSES AT RMC

General

General conditions for admission to third year courses of study leading to a degree at RMC are as prescribed in the RMC Calendar and the RMC Academic Regulations. However, admission to all degree course programs is granted only with the approval of the head of department concerned. Heads of Departments at RMC are always available to give advice concerning preparation for, and admission to, their degree programs. General enquiries should be directed to the Registrar, Royal Military College of Canada, Kingston, Ontario, K7L 2W3.

General Requirement for admission to third year at RMC

The general requirement for admission to a third year degree course at RMC is that candidates will have the same basic preparation for their course from whichever CMC they have come.

Entry into Honours is normally limited to students who pass at the end of the second year with at least 66 per cent in the subjects of the Honours Course of Study. An overall average of at least 60 per cent will also normally be required.

In order to meet an RMC requirement for a course in Canadian History, a specified course in this subject may have to be taken in third year at RMC.

Entry Requirements for RMC Degrees in Arts (BA)

The general requirement for admission to all third year Arts (B.A.) programs at RMC is met by successful completion of one of the second year courses of study available at a CMC.

However, specific requirements for honours standing in particular courses will apply for admission to Honours Arts degree courses. Also depending on the Arts degree program entered, specified courses may have to be taken in place of electives in either Honours or General courses.

Entry requirements for RMC Degrees in Science (BSc)

MATHEMATICS AND PHYSICS

The following second year courses of study will meet the requirements for admission to third year Mathematics and Physics (General and Honours) at RMC:

Science.
Engineering.

Entry into the Honours course of study is limited to those who obtain at least 66 per cent combined average in mathematics and physics courses in the second year. An overall average of at least 60 per cent will normally be required. For entry into the General course of study, the combined average must be at least 55 per cent and the overall average at least 50 per cent.

SCIENCE (APPLIED)

The following second year courses of study will meet the requirements for admission to third year Science (Applied) at RMC:

Science.
Engineering.

Entry requirements for RMC Degrees in Engineering (BEng)

To enter a third year engineering program a student must have the approval of the Head of the department or the professor in charge of the program concerned. This normally requires the successful completion of the second year engineering program at RMC, RRMC or CMR with at least the following combined averages in Mathematics, Physics, Chemistry and Engineering courses:

a. 55 per cent for —

(1) Civil Engineering,
(2) Computer Engineering,
(3) Electrical Engineering,
(4) Engineering and Management,
(5) Fuels and Materials Engineering,
(6) Mechanical Engineering.

b. 66 per cent for Engineering Physics.

CONDITIONS FOR TRANSFER FROM THE RMC AND CMR INTO THIRD YEAR DEGREE COURSES AT RRMC

Royal Roads Military College offers degree programs in Physics and Oceanography, in Physics and Computer Science, in General Science, and in Military and Strategic Studies.

Bachelor of Science (BSc) in Physics and Oceanography

The purpose of this program 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, and mathematics; who have 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.

The purpose of specialization in physics and oceanography is to learn how to apply physical laws and use the techniques of the exact sciences to solve problems. The student studies the characteristics of the environments in which military forces operate . . . the structure of the earth, the ocean bed, the air-sea interface including ice, the atmosphere and space, and especially the water column. Chemical and biological oceanography are studied, but there is more emphasis upon physical oceanography because it is more closely related to military problems. Course details are given in the RRMC calendar.

The Physics and Oceanography degree is offered as a General degree, a Combined Major degree, and exceptional students may be awarded a Combined Major with Honours upon completion of additional requirements. The Honours program is required by some engineering classifications. Either the Combined Major or Honours programs are suitable preparation for graduate work in any of several fields. Note that to become a fully professional aceanographer requires graduate study, as in some other professions.

Entry requires satisfactory completion of second year in any CMC science or engineering program of study which includes a course in chemistry. For admission to the General program, preference will be given to candidates whose programs included Mathematics RR241 and Engineering RR232, or their equivalents. Both are required for admission to the Combined Major, as is a weighted grade average in mathematics, science and engineering subjects of at least D + . Mathematics RR252, or its equivalent, is also very desirable. For admission to the Honours program, 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 + is required.

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

Bachelor of Science (BSc) in Physics and Computer Science

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 programme 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 Engineering (IEEE). The IEEE part of the curriculum places a greater emphasis upon militarily relevant hardware than does that of the ACM.

Completion of second year in a CMC science or engineering programme of study which includes a course in chemistry and in Mathematics RR 241 and Mathematics RR 252 or their equivalents is required for admission. A weighted average of at least D+ is required in mathematics, science and engineering courses.

Third Year enrolment will be limited in numbers. Preference will be given to officer cadets in accordance with their overall academic and military performance.

Bachelor of Science (BSc) in General Science

The BSc programmme in General Science is normally entered from one of the other science programmes. 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 programmes, but the choice of electives is more flexible and fewer credits are required for the degree.

Satisfactory completion of second year in any CMC science or engineering programme of study which includes a course in chemistry is required for admission.

Bachelor of Arts (BA) in Military History and Strategic Studies

The program in Military History and Strategic Studies, offered at the General and Honours level, gives students a sound grounding in military history, strategic thought, international relations as well as in Canadian political and economic issues. Although based primarily upon History and Political Science, the new programme is interdisciplinary, and will offer electives in Computing Science, Economics, English and Philosophy. Despite its interdisciplinary nature, students can achieve considerable subject specialization through the Honours stream.

The BA Military History and Strategic Studies degree builds upon the existing two-year course of studies in effect at all Canadian Military Colleges. Accordingly, students who have satisfactorily completed two years of study at any CMC are eligible for admission to the new program. The program is sufficiently flexible to enable students who, during their two initial years, may not have taken courses that are considered essential to "core subjects" in the third and fourth years, to do so.

NOTE — More details about transfers between Colleges may be obtained from the Registrar at RRMC.

OUTLINE OF COURSES

Preparatory Year

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	
Mother Tongue: English 603-110, 603-210	3	—	3	3	—	3	
Second Language: French	4	—	4	4	—	4	(a)
Social and Economic History of Canada: 330-924	3	—	3	—	—	—	
Introduction to Economics I: 383-920	3	—	3	(3)	—	(3)	(b) (d)
Introduction to Applied Mathematics A: 201-101	3	2	5	—	—	—	
Linear Algebra 201-105	—	—	—	3	2	5	
Differential and Integral Calculus: 201-103	3	2	5	—	—	—	
Mechanics: 203-101	—	—	—	3	2	5	
General Chemistry: 202-111	(3)	(2)	(5)	—	—	—	(c)
General Chemistry: 202-101	—	—	—	3	2	5	
Additional courses (Mathematics, Chemistry, Physics)	—	(2)	(2)	—	(3)	(3)	
Number of periods per week*	15-19	7-11	22-30	12-16	9-12	21-28	

(a) This course is compulsory for anglophone students.

(b) During the first term, 383-920 is given to half of the students and to the other half during the second term.

(c) For those students who are lacking the prerequisite background to undertake the study of General Chemistry, 202-101. .

(d) Students who are taking course 202-111 will take course 383-920 during the second term.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

First Year — Science and Engineering

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	
Mother Tongue: English 603-310, 603-410	3	—	3	3	—	3	
Second Language: French	(4)	—	(4)	(4)	—	(4)	(a)
Introduction to Psychology I: 350-101	3	—	3	—	—	—	
Differential and Integral Calculus II: 201-203	3	2	5	—	—	—	
Numerical Methods: 201-408	—	—	—	3	2	5	
Political and Social Philosophy 340-225	—	—	—	3	—	3	(c)
Electricity and Magnetism: 203-201	3	2	5	—	—	—	
Waves and Modern Physics 203-301	—	—	—	3	2	5	
Experimental Physics: 203-902	—	2	2	1	2	3	(b)
Chemistry of Solutions: 202-201	3	2	5	—	—	—	
Introduction to Economics I: 383-920	(3)	—	(3)	—	—	—	(c)
Additional Courses (Mathematics, Chemistry, Physics)	—	(3)	(3)	—	(2)	(2)	
Number of periods per week*	15-22	11-14	26-36	13-17	9-11	22-28	

(a) Students who have not attained the (fully) integral level in French second language take this course.

(b) Part of this course is given during the first term to optimize the use of the laboratory facilities.

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

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

First Year — Administration and Arts

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	
Mother Tongue: English 603-310, 603-410	3	—	3	3	—	3	
Second Language: French	(4)	—	(4)	(4)	—	(4)	(a)
Differential and Integral Calculus II: 201-203	—	—	—	3	2	5	
Introduction to Economics II: 383-921	—	—	—	3	—	3	
Economic Geography of Canada: 320-901	3	—	3	—	—	—	
Introduction to Psychology I: 350-101	3	—	3	—	—	—	
Introduction to Psychology II: 350-201	—	—	—	3	—	3	
Western Civilization: 330-901	—	—	—	3	—	3	
Decolonization & Problems of the Third World: 330-983	3	—	3	—	—	—	
Political and Social Philosophy 340-225	3	—	3	—	—	—	(b)
Physical Science: 203-927	3	—	3	—	—	—	
Topics in Administration: 410-102	—	—	—	3	—	3	
Introduction to Economics I: 383-920	(3)	—	(3)	—	—	—	(b)
Number of periods per week*	18-25	3	21-28	18-22	5	23-27	

(a) Students who have not attained the (fully) integral level in French second language take this course.

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

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Second Year — Engineering (1)

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	
Mother Tongue: English: ENG 211	—	—	—	2	—	2	
Second Language: French	(3)	—	(3)	(3)	—	(3)	(a) (b)
MLM 221 Social Psychology	3	—	3	—	—	—	
MAT 212 Linear Algebra	3	1	4	—	—	—	
MAT 221 Differential and Integral Calculus III	3	—	3	—	—	—	
MAT 222 Differential and Integral Calculus IV	—	—	—	3	—	3	
MAT 223 Differential and Integral Calculus V	—	—	—	(3)	—	(3)	(c)
MAT 251 Probability and Statistics	—	—	—	3	—	3	
PHY 211 Mechanics	3	1	4	—	—	—	
PHY 222 Electromagnetism	—	—	—	3	1	4	
PHY 231 Oscillations, Waves and Electric Circuits	3	1	4	—	—	—	
PHY 262 Modern Physics	—	—	—	3	1	4	
CHM 241 Physical Chemistry	3	—	3	—	—	—	
CHM 242 Physical Chemistry	—	—	—	3	—	3	
ING 210 Engineering Graphics I	1	2	3	—	—	—	
ING 220 Engineering Graphics II	—	—	—	1	2	3	
ING 230 Strength of Materials	—	—	—	3	1	4	
FLS 203 — FLS 213	(3)	—	(3)	(3)	—	(3)	(d)
Number of periods per week*	19-25	8	27-33	21-30	8	29-38	

(1) This program should normally be taken by those students who intend to take third year Engineering or Honours Science at RMC or Physics and Physical Oceanography at RRMC. May also be taken by students who intend to register in any of the science options offered in third year at CMR.

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Second Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) Optional course — MAT 223 is recommended for admission into Honours Physics and into Major in Physics and Minor in Mathematics at CMR and for admission into Honours Mathematics and Physics at RMC.

(d) Optional course. Anglophones who have attained functional level in FSL may, upon request, be permitted to take this course.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Second Year — Science (1)

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	
Mother Tongue:							
English: ENG 211	—	—	—	2	—	2	
Second Language:							
French	(3)	—	(3)	(3)	—	(3)	(a) (b)
MLM 221 Social Psychology	3	—	3	—	—	—	
MAT 212 Linear Algebra	3	1	4	—	—	—	(c)
MAT 221 Differential and Integral Calculus III	3	—	3	—	—	—	
MAT 222 Differential and Integral Calculus IV	—	—	—	3	—	3	
MAT 223 Differential and Integral Calculus V	—	—	—	(3)	—	(3)	(d)
MAT 251 Probability and Statistics	—	—	—	(3)	—	(3)	(c)
PHY 211 Mechanics	3	1	4	—	—	—	
PHY 222 Electromagnetism	—	—	—	3	1	4	
PHY 231 Oscillations, Waves and Electric Circuits	3	1	4	—	—	—	
PHY 262 Modern Physics	—	—	—	3	1	4	
CHM 241 Physical Chemistry	3	—	3	—	—	—	
CHM 242 Physical Chemistry	—	—	—	3	—	3	
CHM 252 Physical Chemistry Laboratory	—	—	—	—	3	3	(e)
FLS 203 — FLS 213	(3)	—	(3)	(3)	—	(3)	(f)
Number of periods per week*	15-24	5-6	20-30	14-29	6-8	22-35	

(1) Students who intend to complete their undergraduate studies at CMR in any Science Program may take this program of studies.

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Second Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) May be postponed till next year by students who intend to register in the B.Sc. (General) program at CMR.

(d) Optional course — MAT 223 is recommended for admission to Honours Physics and to Major in Physics and Minor in Mathematics at CMR.

(e) May be replaced by ING 230 (See Second Year — Engineering).

(f) Optional course. Anglophones with functional level in FSL may, upon request, be permitted to take this course.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Second Year — Science (Applied) (1)

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	
Mother Tongue:							
English: ENG 211	—	—	—	2	—	2	
Second Language:							
French	(3)	—	(3)	(3)	—	(3)	(a) (b)
MLM 221 Social Psychology	3	—	3	—	—	—	
MAT 212 Linear Algebra	(3)	(1)	(4)	—	—	—	(c)
MAT 221 Differential and Integral Calculus III	3	—	3	—	—	—	
MAT 222 Differential and Integral Calculus IV	—	—	—	3	—	3	
MAT 251 Probability and Statistics	—	—	—	(3)	—	(3)	(c)
PHY 211 Mechanics	3	1	4	—	—	—	
PHY 222 Electromagnetism	—	—	—	3	1	4	
PHY 231 Oscillations, Waves and Electric Circuits	3	1	4	—	—	—	
PHY 262 Modern Physics	—	—	—	3	1	4	
CHM 241 Physical Chemistry	3	—	3	—	—	—	
CHM 242 Physical Chemistry	—	—	—	3	—	3	
CHM 252 Physical Chemistry Laboratory	—	—	—	—	3	3	(d)
ING 210 Engineering Graphics I	1	2	3	—	—	—	
FLS 203 — FLS 213	(3)	—	(3)	(3)	—	(3)	(e)
Number of periods per week*	16-25	7-8	23-33	14-26	6-8	22-32	

(1) This program should normally be taken by those students who intend to take third year in Science (Applied) at RMC. May also be taken by students who intend to register in the B.Sc. (General) program at CMR.

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Second Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) Not required for Science (Applied) degree at RMC, but recommended. Required either in the second year or the third year for Science (General) degree at CMR.

(d) May be replaced by ING 230 (See Second Year — Engineering).

(e) Optional course. Anglophones with functional level in FSL may, upon request, be permitted to take this course.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Second Year — Administration

Courses	Periods per week		Notes
	First Term	Second Term	
Physical Education	2	2	
Drill	1	1	
Second Language: French	(3)	(3)	(a) (b)
Mother Tongue: English: ENG 212	3	—	
ADM 231 Accounting I	3	—	
ADM 232 Accounting II	—	3	
ADM 241 Managerial Mathematics	3	—	
ADM 242 Probability & Statistics	—	3	
ADM 251 Written and Oral Communication	—	3	
INF 251 Introduction to Business Data Processing	3	—	
SCH 212 Microeconomic Analysis	—	3	
SCH 221 Political Science	3	—	
SCH 222 Canadian Political Institutions	—	3	
MLM 221 Social Psychology	3	—	
Seminars, Symposia, Industrial Visits	3	3	
FLS 203 — FLS 213	(3)	(3)	(c)
Number of periods per week*	24-30	21-27	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Second Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) Optional course. Anglophones with functional level in FSL may, upon request, be permitted to take this course.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Second Year — BA (Canadian Studies and Administration)

Courses	Periods per week		Notes
	First Term	Second Term	
Physical Education	2	2	
Drill	1	1	
Mother Tongue:			
English: ENG 212	3	—	
Second Language:			
French	(3)	(3)	(a) (b)
ADM 231 Accounting I	3	—	
ADM 241 Managerial Mathematics	3	—	
ADM 242 Probability & Statistics	—	3	
ADM 251 Written and Oral Communication	—	3	
INF 251 Introduction to Business Data Processing	3	—	
MLM 221 Social Psychology	3	—	
MLM 322 Organizational Psychology	—	3	
SCH 221 Political Science	3	—	
SCH 222 Canadian Political Institutions	—	3	
SCH 254 Canadian Society	—	(3)	(c)
FLS 203 — FLS 213	(3)	(3)	(d)
Number of periods per week*	21-27	15-21	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Second Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) This course will be offered every two years from 1980-1981.

(d) Optional course. Anglophones with functional level FSL may, upon request, be permitted to take this course.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Second Year — BA (Military and Strategic Studies) (1)

Courses	Periods per week		Notes
	First Term	Second Term	
Physical Education	2	2	
Drill	1	1	
INF 251 Introduction to Business Data Processing	3	—	
MLM 221 Social Psychology	3	—	
SCH 221 Political Science	3	—	
SCH 216 Classical Strategy	3	—	
Seminars, visits CMR 201	3	—	(d)
and meetings CMR 202	—	3	(d)
ADM 242 Probability & Statistics	—	3	
MLM 232 Psychology of Aggressive Behaviour	—	3	
SCH 222 Canadian Political Institutions	—	3	
SCH 232 Canadian Military History	—	3	
FLS 203	(3)	—	(b)
FLS 213	—	(3)	(b)
Mother Tongue: English: ENG 212	3	—	
ENG 251 Written and Oral Communication	—	3	
Second Language: French	(3)	(3)	(a) (c)
Number of periods per week*	18-24	21-27	

(1) This program may permit the normal degree of transferability within the CMC's and different options.

(a) In order to maintain their knowledge of French as a Second Language, Second Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Optional course. Anglophones with functional level FSL may, upon request, be permitted to take this course.

(c) Students who have not attained the "integral" level in French second language (FSL) take this course.

(d) These courses will not be offered in 1984-1985.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Third Year — BSc 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	(3)	—	(3)	—	—	—	(a) (c)
FLS 312	—	—	—	(3)	—	(3)	(a) (c)
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	
PHY 426 Logic Circuits Design	—	—	—	(3)	—	(3)	(b)
SCH 326 Nuclear Strategy	—	—	—	3	—	3	
Number of periods per week*	20-13	7	27-30	20-26	7	27-33	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) Optional.

(c) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Third Year — BSc 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	(3)	—	(3)	—	—	—	(a) (b)
FLS 312	—	—	—	(3)	—	(3)	(a) (b)
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	
PHY 426 Logic Circuits Design	—	—	—	(3)	—	(3)	
SCH 326 Nuclear Strategy	—	—	—	3	—	3	
Number of periods per week*	20-23	7	27-30	17-23	7	24-30	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

Third Year — BSc (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		(3)	—	(3)	—	—	—	(a) (d)
* FLS 312		—	—	—	(3)	—	(3)	(a) (d)
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 I		(3)	—	(3)	3	—	3	(c)
PHY 323 Experimental Electronics I		2	2	4	—	—	—	
PHY 324 Experimental Electronics II		—	—	—	2	2	4	
* SCH 326 Nuclear Strategy		—	—	—	3	—	3	
PART B								
INF 351 Computer Science in Administration		3	—	3	—	—	—	
MLM 322 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	14-24	5	19-29	14-23	5	19-28	
	A + C	13-23	11	24-34	12-21	9-12	21-33	

(1) A BSc (General) may normally be obtained by combining either parts A and B or parts A and C. With the authorization of the Faculty Council, is it also possible to get a BSc (General) by replacing, timetable permitting, one or more courses of the selected program by equivalent or more demanding courses offered by the departments of the Science division. (An asterisk indicates a course that cannot be replaced.)

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) For students who have not taken this course in second year.

(c) May be given either term.

(d) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

** The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Third Year — Administration

Courses	Periods per week		Notes
	First Term	Second Term	
Physical Education	2	2	
Drill	1	1	
FLS 302	(3)	—	(a) (d)
FLS 312	—	(3)	(a) (d)
ADM 321 Personnel Management	3	(3)	(b)
ADM 323 Commercial & Fiscal Law	(3)	3	(c)
ADM 331 Finance	3	—	
ADM 332 Management Accounting	—	3	
ADM 341 Applied Statistics	3	—	
ADM 342 Operations Research I	—	3	
MLM 322 Organizational Psychology	—	3	
SCH 313 Macroeconomic Analysis	3	—	
SCH 326 Nuclear Strategy	—	3	
Seminars, Symposia and Industrial Visits	3	3	
Elective courses	3	6	(e)
Number of periods per week*	21-24	27-30	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) This course is given in English at the first term and in French at the second term.

(c) This course is given in French at the first term and in English at the second term.

(d) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(d) 1. **First term**
The student has the choice between:
SCH 311 Economic History in a Social Context
or
INF 351 Computer Science in Administration

2. **Second term**
The student has to take two of the four following courses:

ADM 324 Public Administration SCH 312 Canadian Economic History	qualitative
ADM 343 Research Methodology MAT 475 System Simulation	quantitative

3. Timetable and personnel permitting.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Third Year — BA (Canadian Studies and Administration)

Courses	Periods per week		Notes
	First Term	Second Term	
Physical Education	2	2	
Drill	1	1	
FLS 302	(3)	—	(a) (f)
FLS 312	—	(3)	(a) (f)
ADM 321 Personnel Management	3	(3)	(b) (j)
ADM 323 Commercial and Fiscal Law	3	(3)	(c)
ADM 331 Finance	3	—	
ADM 463 Industrial Relations	3	—	
ENG 301 Canadian Literature in English I	(3)	—	(d)
ENG 302 Canadian Literature in English II	—	(3)	(d)
FRA 301 Littérature québécoise I	(3)	—	(d)
FRA 302 Littérature québécoise II	—	(3)	(d)
SCH 232 Military History of Canada	—	(3)	(e)
SCH 254 Canadian Society	—	(3)	(d)
SCH 311 Economic History in a Social Context	3	—	
SCH 312 Canadian Economic History	—	3	
SCH 326 Nuclear Strategy	—	3	
SCH 452 Canadian Civilization	3	—	(g)
One elective course	—	3	(h)
Seminars, visits & meetings	3	3	
Number of periods per week*	21-30	24-36	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.
(b) This course is given in English at the first term and in French at the second term.
(c) This course is given in French at the first term and in English at the second term.
(d) This course will be offered every two years from 1982-1983.
(e) For those students who did not take this course in 2nd year.
(f) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.
(g) Not offered this year.
(h) ADM 232: Accounting II; ADM 324: Public Administration.
(j) Students who have not taken ADM 251 must take this course.
* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Third Year — BA 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 323 Contemporary Military Figures	3	—	
ADM 323 Introduction to Law	3	—	
SCH 318 Soviet Defence Policy	—	3	
PHY/CHM 399 Technology of Weapons	—	3	
SCH 319 Great Battles	—	3	
LIT 340 Canadian Literature and Military Experience	(3)	3	(c)
FLS 302	(3)	—	(a) (b)
FLS 312	—	(3)	(a) (b)
SCH 326 Nuclear Strategy	—	3	
Number of periods per week*	21-27	18-24	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) May be given either term.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Third Year — BA (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 323 Contemporary Military Figures	3	—	
SCH 318 Soviet Defence Policy	—	3	
LIT 340 Canadian Literature and Military Experience	(3)	3	(d)
FLS 302	(3)	—	(a) (b)
FLS 312	—	(3)	(a) (b)
SCH 326 Nuclear Strategy	—	3	
Two elective courses	6	—	(c)
Two elective courses	—	6	(c)
Number of periods per week*	18-24	18-24	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) 1. **First term:**
ADM 323 Introduction to Law.
FRA 310 Guerre et Littérature. (Not offered)
MAT 335 Introduction to Game Theory.
SCH 317 Defence Economics.
SCH 311 Economic History in a Social Context.
SCH 313 Macroeconomic Analysis.

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

3. Timetable and Personnel permitting.

(d) May be given either term.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Third Year — BSc (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	—	—	—	
MAT 461 Numerical Analysis	3	—	3	—	—	—	
MAT 475 System Simulation	—	—	—	3	—	3	
INF 361 Computer Architecture and Assembler Programming	3	—	3	—	—	—	
INF 362 Mini-computer Systems	—	—	—	3	—	3	
INF 363 Structured System Analysis	—	—	—	3	—	3	
ADM 231 Accounting I	3	—	3	—	—	—	
ADM 232 Accounting II	—	—	—	3	—	3	
ADM 342 Operations Research I	—	—	—	3	—	3	
PHY 481 Logic Circuit Design and Applications	—	—	—	3	3	6	
FLS 302 — FLS 312	(3)	—	(3)	(3)	—	(3)	(a) (b)
SCH 326 Nuclear Strategy	—	—	—	3	—	3	
One elective course	3	—	3	—	—	—	(c)
Number of periods per week*	18-21	3	21-24	21-24	6	27-30	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) 1.
ADM 341 Applied Statistics (3,—,3)
ADM 452 Public Relations and Marketing (3,—,3)
SCH 313 Macroeconomic Analysis (3,—,3)
2. Timetable and Personnel permitting.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Third Year — BSc (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	—	—	—	
INF 361 Computer Architecture and Assembler Programming	3	—	3	—	—	—	
INF 362 Mini-computer Systems	—	—	—	3	—	3	
MAT 312 Numerical Methods in Linear Algebra	—	—	—	3	—	3	
MAT 321 Differential Equations I	4	—	4	—	—	—	
MAT 322 Differential Equations II	—	—	—	4	—	4	
MAT 328 Analysis I	3	—	3	—	—	—	
MAT 381 Structured Programming	3	—	3	—	—	—	
MAT 461 Numerical Analysis	3	—	3	—	—	—	
MAT 471 Operations Research	—	—	—	3	—	3	
PHY 481 Logic Circuits Design and Applications	—	—	—	3	3	6	
FLS 302 — FLS 312	(3)	—	(3)	(3)	—	(3)	(a) (b)
SCH 326 Nuclear Strategy	—	—	—	3	—	3	
One elective course	3	—	3	—	—	—	(c)
One elective course	—	—	—	3	—	3	(c)
Number of periods per week*	21-25	3-7	28	22-25	6	28-31	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) 1. **First term**
ADM 341 Applied Statistics (3,—,3)
PHY 381 Electronics and Applications I (2,4,6)
2. **Second term**
INF 363 Structured System Analysis (3,—,3)
MAT 351 Probability (3,—,3)
3. Timetable and Personnel permitting.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Third Year — BSc (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	—	—	—	
INF 361 Structured System Analysis	3	—	3	—	—	—	
INF 362 Mini-computer Systems	—	—	—	3	—	3	
MAT 321 Differential Equations I	4	—	4	—	—	—	
MAT 322 Differential Equations II	—	—	—	4	—	4	
MAT 328 Analysis I	3	—	3	—	—	—	
MAT 381 Structured Programming	3	—	3	—	—	—	
PHY 381 Electronics and Application I	2	4	6	—	—	—	
PHY 382 Electronics and Application II	—	—	—	2	4	6	
PHY 481 Logic Circuits Design and Applications	—	—	—	3	3	6	
FLS 302 — FLS 312	(3)	—	(3)	(3)	—	(3)	(a) (b)
SCH 326 Nuclear Strategy	—	—	—	3	—	3	
One elective course	3	—	3	—	—	—	(c)
One elective course	—	—	—	3	—	3	(c)
Number of periods per week*	21-24	7	28-31	18-21	10	28-31	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) 1. **First term**
PHY 311 Classical Methods (3,—,3)
PHY 341 Statistical Physics (3,—,3)
2. **Second term**
PHY 316 Mechanics of Continuous Media (3,—,3)
PHY 361 Atomic and Nuclear physics (3,—,3)
PHY 421 Electrodynamics (3,—,3)
3. Timetable and personnel permitting.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Third Year — BSc (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	—	—	—	
INF 361 Computer Architecture and Assembler Programming	3	—	3	—	—	—	
INF 362 Mini-computer Systems	—	—	—	3	—	3	
INF 363 Structured System Analysis	—	—	—	3	—	3	
PHY 381 Electronics and Applications I	2	4	6	—	—	—	
PHY 382 Electronics and Applications II	—	—	—	2	4	6	
PHY 481 Logic Circuit Design and Application	—	—	—	3	3	6	
MAT 321 Differential Equations I	4	—	4	—	—	—	
MAT 328 Analysis I	3	—	3	—	—	—	
MAT 381 Structured Programming	3	—	3	—	—	—	
MAT 461 Numerical Analysis	3	—	3	—	—	—	
FLS 302 — FLS 312	(3)	—	(3)	(3)	—	(3)	(a) (b)
SCH 326 Nuclear Strategy	—	—	—	3	—	3	
One elective course	—	—	—	3 or 4	—	3 or 4	(c)
Number of periods per week*	21-24	7	28-31	17-21	10	27-31	

(a) Students who have not attained the "integral" level in French second language (FSL) take this course.

(b) In order to maintain their knowledge of French as a Second Language, Third Year anglophone students who have reached the "integral" level have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) MAT 322 Differential Equations II (4,—,4); MAT 475 Simulation (3,—,3).

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Fourth Year — BSc 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	
FLS 402	(3)	—	(3)	—	—	—	(a) (b)
FLS 412	—	—	—	(3)	—	(3)	(a) (b)
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*	15-21	10	25-31	18-27	10	28-37	

(a) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Students who have not attained the "integral" level in French second language (FSL) take this course.

(c) Optional.

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

(e) Optional.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Fourth Year — BSc 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	
FLS 402	(3)	—	(3)	—	—	—	(a) (b)
FLS 412	—	—	—	(3)	—	(3)	(a) (b)
MAT 321 Differential Equations I	3	1	4	—	—	—	
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 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*	12-18	11	23-29	12-15	10	22-25	

(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) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Students who have not attained the "integral" level in French second language (FSL) take this course.

(c) Optional.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Fourth Year — BSc (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	
* FLS 402	(3)	—	(3)	—	—	—	(a) (b)
* FLS 412	—	—	—	(3)	—	(3)	(a) (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 331 Finance	3	—	3	—	—	—	
ADM 413 Organizational Development	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	—	—	—	
CHM 442 Physical Chemistry	—	—	—	2	2	4	
Number of periods per week** A + B	18-24	10	28-34	12-18	10	22-28	
Number of periods per week** A + C	13-19	14	27-33	13-19	14	27-33	

(1) A BSc (General) may normally be obtained by combining either parts A and B or parts A and C. With the authorization of the Faculty Council, it is possible to get a BSc (General) by replacing, timetable permitting, one or more courses of the selected programme by equivalent or more demanding courses offered by the departments of the Science division. (An asterisk indicates a course that cannot be replaced.)

(a) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Students who have not attained the "integral" level in French second language (FSL) take this course.

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

(d) Optional.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

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)	—	(b) (c)
FLS 412	—	(3)	(b) (c)
ADM 412 Business Policy	—	3	
ADM 414 Operations Management	—	3	
ADM 450 Information Systems Analysis	—	3	
ADM 452 Marketing	3	—	
ADM 460 Project in Administration	(1½)	(1½)	
ADM 463 Industrial Relations	3	—	
SCH 412 Managerial Economics	3	—	
SCH 421 International Relations II	—	3	
Seminars, Symposia & Industrial Visits	3	3	
Two elective courses	6	—	(d)
Number of periods per week*	19½-22½	22½-28½	

(a) Optional course.

(b) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(c) Students who have not attained the "integral" level in French second language (FSL) take this course.

1. **First term**

One elective course — ADM 413 Organizational Development / ADM 433 Introduction to Income Tax

One elective course — ADM 431 Operational Auditing / ADM 441 Operations Research II

2. Timetable and personnel permitting.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Fourth Year — BA (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	
FLS 402	(3)	—	(a) (b)
FLS 412	—	(3)	(a) (b)
SCH 232 Military History of Canada	—	3	
SCH 254 Canadian Society	—	(3)	(c)
SCH 415 Canadian Defence Policy	3	—	
SCH 421 International Relations II	—	3	
SCH 424 The Canadian Identity	—	3	
SCH 452 Canadian Civilization	—	3	(f)
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*	21-24	27-30	

(a) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Students who have not attained the "integral" level in French second language (FSL) take this course.

(c) This course will be offered from 1982-83, every two years to those who have not already taken it in the second or third year.

(d) This course will be offered every two years from 1981-1982.

(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.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

(f) Not offered this year.

(1) Replaced by Third Year courses FRA 301 and ENG 30 in 84-85.

(2) Replaced by Third Year courses FRA 302 and Eng 302 in 84-85.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Fourth Year — BA with Honours in Military and Strategic Studies

Courses	Periods per week		Notes
	First Term	Second Term	
Physical Education	2	2	
Drill	1	1	
MLM 415 Sociology of Warfare	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	
SCH 426 Comparative Defence Policies	—	3	
SCH 419 Current Strategic Problems	—	3	
SCH 440 Arms Control	—	3	
SCH 450 Third World	3	—	
LIT 340 Canadian Literature and Military Experience	(3)	3	(c)
FLS 402	(3)	—	(a) (b)
FLS 412	—	(3)	(a) (b)
Number of periods per week*	27-33	21-27	

(a) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Students who have not attained the "integral" level in French second language (FSL) take this course.

(c) May be given either term.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Fourth Year — BA (Military and Strategic Studies)

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	
SCH 419 Current Strategic Problems	—	3	
SCH 440 Arms Control	—	3	
FLS 402	(3)	—	(a)(b)
FLS 412	—	(3)	(a)(b)
LIT 340 Canadian Literature and Military Setting	(3)	3	(d)
Two elective courses	6	—	(c)
Two elective courses	—	6	(c)
Number of periods per week*	18-24	18-24	

(a) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Students who have not attained the "integral" level in French second language (FSL) take this course.

(c) 1. **First term:**
ADM 411 Decision Making.
ADM 413 Department Control in Non-Profit Organization – ADM 334 prerequisite.
ADM 425 War and the Law.
ADM 463 Industrial Relations
ENG 405 Great Books of the Western World. (Not offered)
MLM 415 Sociology of Warfare.

2. **Second term:**
FRA 410 Les Idées du XX^{e} siècle. (Not offered)
MAT 476 War Games – MAT 335 prerequisite.
MLM 412 Job Adjustment and Personality.
SCH 426 Comparative Defence Policy.

3. Timetable and Personnel permitting.

(d) May be given either term.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Fourth Year — BSc (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	
INF 351 Computer Science in Administration	3	—	3	—	—	—	
INF 442 Data and File Structures	3	—	3	—	—	—	
INF 443 Data Base Management Systems (DBMS)	—	—	—	3	—	3	
INF 461 Operating Systems	3	—	3	—	—	—	
INF 471 Computer Graphics	3	—	3	—	—	—	
ADM 331 Finance	3	—	3	—	—	—	
ADM 414 Operations Management	—	—	—	3	—	3	
ADM 450 Information Systems Analysis	—	—	—	3	—	3	
ADM 493 Project	—	2	2	—	3	3	
FLS 402 — FLS 412	(3)	—	(3)	(3)	—	(3)	(a) (b)
One elective course	3	—	3	—	—	—	(c)
One elective course	—	—	—	3	—	3	(c)
Number of periods per week*	18-21	5-8	23-29	15-18	6	21-24	

(a) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Students who have not attained the "integral" level in French second language (FSL) take this course.

(c) 1. **First term**
PHY 482 Microprocessor System Design and Applications (3,3,6)
ADM 441 Operations Research II (3,—,3)
SCH 412 Managerial Economics (3,—,3)

2. **Second term**
ADM 232 Accounting II (3,—,3)
ADM 412 Business Policy (3,—,3)

3. Timetable and Personnel permitting.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Fourth Year — BSc (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	
INF 351 Computer Science in Administration	3	—	3	—	—	—	
INF 442 Data and File Structures	3	—	3	—	—	—	
INF 461 Operating Systems	3	—	3	—	—	—	
MAT 329 Analysis II	3	—	3	—	—	—	
MAT 413 Introduction to Applied Algebra	3	—	3	—	—	—	
MAT 421 Methods of Applied Mathematics	3	—	3	—	—	—	
MAT 423 Introduction to the Num. Solution of Ord. & Part Diff. Equa.	—	—	—	3	—	3	
MAT 475 System Simulation	—	—	—	3	—	3	
MAT 493 Project	—	2	2	—	3	3	
FLS 402 — FLS 412	(3)	—	(3)	(3)	—	(3)	(a) (b)
Two elective courses	6	—	6	—	—	—	(c)
Two elective courses	—	—	—	6	—	6	(c)
Number of periods per week*	21-24	5-8	26-32	18-21	6-7	24-28	

(a) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Students who have not attained the "integral" level in French second language (FSL) take this course.

(c) 1. **First term**
ADM 341 Applied Statistics (3,—,3)
ADM 441 Operations Research II (3,—,3)
INF 471 Computer Graphics (3,—,3)
PHY 482 Microprocessor System Design and Applications (3,3,6)

2. **Second term**
MAT 330 Methods of Optimization (3,—,3)
MAT 463 Discrete Mathematical Structures (3,—,3)
PHY 334 Signal Analysis (3,1,4)

3. Timetable and Personnel permitting.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Fourth Year — BSc (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	
INF 442 Data and File Structures	3	—	3	—	—	—	
INF 461 Operating Systems	3	—	3	—	—	—	
INF 471 Computer Graphics	3	—	3	—	—	—	
MAT 329 Analysis II	3	—	3	—	—	—	
MAT 475 System Simulation	—	—	—	3	—	3	
PHY 334 Signal Analysis	—	—	—	3	1	4	
PHY 482 Microprocessor System Design and Applications	3	3	6	—	—	—	
PHY 493 Project	—	2	2	—	3	3	
FLS 402 — FLS 412	(3)	—	(3)	(3)	—	(3)	(a) (b)
One elective course	3	—	3	—	—	—	(c)
One elective course	—	—	—	3	—	3	(c)
Number of periods per week*	18-21	8-9	26-30	12-15	7	19-22	

(a) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Students who have not attained the "integral" level in French second language (FSL) take this course.

(c) 1. **First term**
PHY 331 Physical Optics (3,1,4)
PHY 471 Solid State Physics (3,—,3)
Second term
PHY 316 Mechanics of Continuous Media (3,—,3)
PHY 361 Atomic and Nuclear Physics (3,—,3)
PHY 421 Electrodynamics (3,—,3)
2. Timetable and Personnel permitting.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

Fourth Year — BSc (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	
PHY 334 Signal Analysis	—	—	—	3	1	4	
PHY 482 Microprocessor System Design and Applications	3	3	6	—	—	—	
INF 351 Computer Science in Administration	3	—	3	—	—	—	
INF 441 Compiler	—	—	—	3	—	3	
INF 442 Data and File Structures	3	—	3	—	—	—	
INF 443 Data Base Management Systems (DBMS)	—	—	—	3	—	3	
INF 461 Operating Systems	3	—	3	—	—	—	
INF 471 Computer Graphics	3	—	3	—	—	—	
INF 371 Teleprocessing	—	—	—	3	—	6	
INF 493 Project	—	2	2	—	3	3	
MAT 329 Analysis II	3	—	3	—	—	—	
MAT 413 Introduction to Applied Algebra	—	—	—	3	—	3	
FLS 402 — FLS 412	(3)	—	(3)	(3)	—	(3)	(a)(b)
Number of periods per week*	18-21	8	26-29	18-21	7	25-28	

(a) In order to maintain their knowledge of French as a Second Language, Fourth Year anglophone students who have reached the "integral" level, have the choice: (i) to opt for ONE university course in French, as the timetable permits, after consultation with the Second Languages Department and with the approval from the department which offers the selected course or (ii) to take a second language course of three periods a week.

(b) Students who have not attained the "integral" level in French second language (FSL) take this course.

* The first number indicates a minimum of periods. The second number indicates a maximum of periods.

PREREQUISITES

In the description of courses, PA, PR and CR mean: absolute prerequisite, relative prerequisite and co-requisite.

The absolute prerequisite (PA)	is a course which, without exception, must be passed before a student can register for the next course.
The relative prerequisite (PR)	is a course which normally must be passed but which in any case must have been taken before a student can register for the next course.
The co-requisite (CR)	is a course that is taken before or concurrently with the course in question.

DEPARTMENT OF ADMINISTRATIVE SCIENCES

Head of Department	Jocelyn Gagné, CD, BCom, MBA
Associate Professors	Paul Boisclair, BA, BCom, MBA Armand St-Pierre, BSc, BCom, BSc Compt., RIA, CGA, MBA
Assistant Professors	Guy Lizotte, BCom, MBA, Dip. en informatique (MIT) Major Réal Tremblay, CD, BCom, MBA, Adm.A.
Lecturers	Captain Michel Beaudry, CD, BSc, MBA Lt (N) Roch Guénette, CD, BCom, MBA Captain Jean-Marc Harvey, CD, B. Sp. Géogr., MBA LCdr Allister Thorne, CD, BEng, MBA
Part-time lecturers	Major Stanley Blythe, CD, BA, LL.B. LCol Michel Crowe, CD, MBA, LL.L. Captain Jean-Pierre White, Commander de l'ordre de St-Hubert, BA, LL.L.

410-102 **Introduction to Administration** 3-0-6

The objectives are: to introduce the student to the principles, tools and functions which direct the daily operations and growth of any lucrative organization; to increase the sensitivity of the student towards the numerous problems that a manager must face on a daily basis and also to acquire the necessary aptitudes that a manager must possess in order to face these problems; and to obtain certain guidelines which will permit the student to further integrate additional notions throughout the Bachelor degree.

After dealing with business in the economic environment, forms of business ownership, overview of management, decision making process and the financial statements, special attention is directed to the management process: planning, organizing, directing and controlling. Finally, in order to visualize the enterprise as a whole the student will be exposed to a brief presentation on Marketing, Finance, Production, Personnel and Information Systems.

ADM 231 **Accounting** 3-0-6

The objective of this course is to introduce the student to the procedure of bookkeeping and the presentation of financial statements.

The student will learn to register transactions in the different journals, to classify them in the accounts of the general ledger and to summarize them in the financial statements by closing the books with the help of the worksheet.

ADMINISTRATIVE SCIENCES

ADM 232 **Accounting II** 3-0-6
PA ADM 231

The aim of this course is to explain the "whys" and "hows" of accounting procedures and to undertake more complex problems in accounting.

After acquiring a basic knowledge of accounting in Accounting I the student will further his knowledge of certain balance sheet items and generally accepted principles of accounting. Special emphasis is placed on inventory valuation methods, depreciation and intangible assets. A study of the flow of funds and ratio analysis will complete the course.

ADM 241 **Managerial Mathematics** 3-0-6
PA 201-101, 201-103, 201-105;
Pr 201-203;
CR INF 251

The aim of the course is to impart to the student the concept of the time value of money by giving him a basic understanding of the mathematics of finance.

In the first half of the course, the fundamental techniques are explained: simple and compound interest, simple discount, simple ordinary annuities, annuities due, deferred annuities and general annuities. In the second half, the basic principles are studied in greater detail and practical applications in accounting and finance are presented — financial and industrial amortizations, sinking funds, bonds and life insurance.

ADM 242 **Probability and Statistics** 3-0-6
PA 201-203; PR INF 251

The aim of this first course in statistics is to familiarize the student with basic probability and statistical concepts as they apply in a business or economic context. Emphasis is placed on interpretation of results from statistical analysis.

The main subjects will be: Introduction and object of probability and statistics. Descriptive statistics. Probabilities and their laws. Conditional probabilities and Baye's theorem. Random variables. Discrete probability distribution models: discrete uniform, binomial, hypergeometric and Poisson. Continuous probability distribution models: continuous uniform, normal and exponential. The central limit theorem. Sampling distributions. Point and interval estimation.

ADM 321 **Personnel Management** 3-0-6
PA 410-102; PR MLM 221, MLM 222

The aim of this course is to expose the students to the practice of personnel management in a modern context. Classes will be conduc-

ted in such a way as to maximize participation of students, using cases, games, simulations, exercises, etc.

Included in the course are: a study of the various theories and practices in the field of personnel management and recent concepts of human resources management and manpower planning. A study of basic personnel management areas of responsibility such as recruiting, selecting, training, remuneration, discipline, evaluation, promotion, transfers, morale, grievance, compensation and retention of personnel. Emphasis is put on basic factors which determine policies rather than on techniques.

ADM 323 **Introduction to civil and military law** 3-0-6

The aim of this course is to give a general understanding of the law which will be useful to future officers in the performance of their duties and in their personal lives. Emphasis on Quebec Civil Law with some treatment of military law.

The meaning and sources of law and administration of justice. Extensive treatment of contracts and obligations. Bankruptcy, matrimonial law, civil responsibility (torts) and consumer protection law.

The section on military law will deal with jurisdiction, arrest, military tribunals, procedure and the Charter of Rights.

ADM 324 **Public Administration** 3-0-6
PR SCH 222

The objective of this course is to familiarize future public administrators of the Department of National Defence with the public sector environment of the department, namely other public sector departments and corporations, regulatory commissions and such central agencies as the Cabinet, Cabinet Committees and their secretariats, the Treasury Board, the Auditor General, the Receiver General and the Department of Supply and Services.

This is achieved by presenting the policy and expenditure management system (PEMS) starting from the official Estimates Documents.

ADM 331 **Finance** 3-2-4
PA ADM 231; PR ADM 241

The objective of this course is to introduce the student to the principles of the financial function of an enterprise. Having defined the function and described its operational context the course addresses the specifics of financial management. It deals with financial management techniques and principles. The course is both a theoretical and practical introduction to financial administration.

The course includes a computerized simulation utilising the following theories: financial analysis, financial planning and control, cash management, financial and operating leverage, financial evaluation and cost of capital, financial markets and financing through stocks, loans, warrants, etc.

ADM 332 **Management Accounting** 3-0-6
PA ADM 231

The emphasis will be on the internal uses of accounting data by managers in directing the affairs of organizations: setting objectives, making decisions and evaluating results.

Although the emphasis is on the uses of accounting data, management accounting principles will be taught in enough depth to ensure full comprehension of this subject.

ADM 341 **Applied Statistics** 3-0-6
PA ADM 242

This second course in statistics aims to familiarize the student with the different methods of analysis used in statistics. Particular emphasis is placed on interpreting results by means of a computer analysis.

The following subjects will be taught: Hypothesis testing: one and two populations. Variance Analysis. Simple and multiple linear regression. Index numbers. Time series analysis and forecasting. Non parametric tests: chi-square test and Kolmogorov-Smirnov.

ADM 342 **Operations Research I** 3-0-6
PA ADM 241, INF 251

The objective of this course is to give the student a broad introduction to Operations research. On completion of the course the student should be familiar with several of the most commonly used operational research models and their underlying assumptions.

The first section of the course will cover simple decision theory, decision trees, utility theory, revised probabilities. Next, the course will present several basic inventory control models, Queueing models and an introduction to Monte Carlo simulation. Finally, linear programming (LP) will be covered in some depth: graphical solutions, the simplex method, matrix notation, degeneracy, unbounded solutions, duality, sensitivity analysis, practical applications, etc. The student will also be asked to solve LP problems using the computer software packages available.

ADM 343 **Research Methods** 3-0-6
PA ADM 341

The objectives of this course are to help the student to define and better formulate his research problems, to become familiar with the necessary tools available for gathering data, to use different scientific statistical methods in analyzing data gathered, and to teach the writing of good, factual, timely, concise and toneless report.

The course will cover a review of statistical concepts, the problems of project formulation and research design, data collection methods and questionnaire design, the theory of measurement, attitude measurement, scaling, reliability and validity, sampling theory design, investigation, association and functional relationship on data analysis, structure, grouping and classification of data analysis, and reporting (communication).

ADM 411 **Decision Making Process** 3-0-6

The main objective of this course is to teach the student how to recognize and identify the basic elements of the most complex problems.

To meet this objective we will teach the technique of using "models" to make accurate decisions, explain why it is that knowing the cause of a problem is not always essential to finding a solution; explain how to use problem-solving tools such as decision tree, break-even point analysis, Delphi method, PERT, operational research methods, creativity, brainstorming, etc. Assistance will be given to improve problem-solving abilities.

ADM 412 **Business Policy** 3-0-6

The objective of this course is to develop the ability of future managers to (1) think about management problems comprehensively, and (2) take those actions which best contribute to the effectiveness of the whole organization, not just their own department. To this end, the course focuses on: (1) diagnosing an organization's internal and external environment, (2) identifying, creating and evaluating strategy, (3) planning functional tactics for achieving objectives, (4) implementing strategy and tactics, and (5) controlling and changing objectives, strategy and tactics in an ongoing operation.

The orientation of this course is practical and requires the student to call upon knowledge acquired in the functional disciplines of management. Students are presented with a wide variety of management problems in many different settings.

ADMINISTRATIVE SCIENCES

ADM 413 **Organization Development** 3-0-6

This course introduces students to the problems associated with organizational change, resistance to such change and interventions.

In the main an experiential approach is taken utilising the experience of the officer cadets within the College as a basis for confirming the conventional theories of organizational development.

ADM 414 **Operations Management** 3-0-6
PA ADM 242, ADM 341, ADM 342

The aim of this course is to familiarize the student with the role of the production function in manufacturing and service industries. Emphasis will be placed on the relationships existing among the different topics (Systematic approach). Equal emphasis is given to quantitative methods and qualitative concepts of management.

The main subjects discussed are: Definition and role. Systems theory. Design of the product and the process. Forecasting techniques. Capacity and location. Layout. Quality control system. Job design and work measurement. Production planning and scheduling. Inventory system using material requirements planning. Critical path scheduling: PERT and CPC. Maintenance. Productivity.

ADM 431 **Operational Auditing** 3-0-6

The objectives of this course are: to introduce the student to the main principles of operational auditing, to analyse the main functions of organizations as seen through the eyes of an operational auditor and to present each student with a real problem which requires the development of a sound operational audit program.

The course covers the following topics: introduction to the concept of operational auditing, the steps of operational auditing, management auditing, auditing the information system, the computer system, the Marketing function, the Production function, the Procurement function, the Human Resource function and the Financial function.

ADM 433 **Introduction to Income Tax** 3-0-6

The objective of this course is to familiarize the student with income tax and its impact on business operations and individuals. Through case studies, the student will be given an understanding of the significance of income tax factors in business, and on individual investor's decisions.

ADM 441 **Operations Research II** 3-0-6
PA ADM 342

The objective of this course is to present the main stochastic methods used in operations research insisting on the effective integration of these techniques in administrative processes.

The following subjects will be covered in the course: decision analysis, finite Markov chains, Markov programming, Queueing models, stochastic inventory control models, and system simulation.

ADM 450 **Information Systems Analysis** 3-0-6
PA INF 251

The first objective of this course is to provide students with a knowledge of management information systems (MIS). The emphasis will be on the purpose and development of these systems and the means by which they are controlled.

A second objective is to give students an understanding of MIS and how to generate information for business and non-profit organizations. Broad areas of study will include: conceptual foundation of accounting information systems (AIS), information technology and AIS or MIS applications. Overview; hardware, software; information systems technology; data collection and storage coding; technique and file processing; files and data base systems, data processing systems; A/R systems and control and AIS; internal control; computer controls and auditing the computer; systems analysis and development; systems design and evaluation; systems implementation; AIS applications.

ADM 452 **Public Relations and Marketing** 3-0-6
PA 410-102

The course includes: the methods used to analyse marketing problems and the variables that affect the decision model of the manager.

Concepts of marketing and terminology, the marketing managers working environment and tools available to him; evaluation and criticism of the different decision models, establishment of decision models, integration of controllable variables.

ADM 460 **Projects in Administration** 1-0-8
(Final course)

SHORT DESCRIPTION

This course is a team project extending over the two semesters of the final year of the program.

These projects are experiential in the sense that they provide the students with a real life situation where they can apply concepts and techniques studied theoretically during their whole program of study.

The team establishes contact with an existing organization within or outside of the CMR. Projects are selected by the students. However the supervisors may assist in the search of a project.

After a phase of familiarization with the area of interest in the organization and a description of its environment, the team defines with the client a specific area of intervention where it will have the opportunity to assist the organization in resolving a concrete problem. Therefore the practical usefulness of the result of the project for the client is one of its evaluation criteria.

OBJECTIVE OF THE COURSE

After having completed their experiential project the students:

a. Should have reviewed some of the concepts and theories introduced during the program and acquired a deeper knowledge of specific techniques brought to bear in the course of the intervention in a real organization.
b. Should have familiarized with the internal climate of an organization, whether it is a small, a medium or a large one, in the private or in the public sector. They will experienced the differences that exist between administration sciences and administration art and the difficulties encountered when one attempts to apply theories in real life settings.
c. Should be able to establish a diagnosis, a relate a specific problem with the global context of the organization. They should have demonstrated some expertise in a specific field, develop some maturity and skills as administrators, capable of intervening in a complex situation, of applying techniques to resolve practical problems. They will have learn to make relevant recommendations after careful analysis, to present them orally and in writing to the client and to their classmates.

ADM 463 **Industrial Relations** 3-0-6

This course introduces the students to the concepts and processes of certification of bargaining units and agents: preparation, negociation, conciliation, arbitration, strike, mediation and day to day administration of collective agreements, especially the administration and adjudication of grievances.

The emphasis is placed on the federal civil service sector, namely: on the Public Service Relations Act (PSSRA), on regulations and decisions of its administrative tribunal (PSSRB), on labour unions such as the Public Service Alliance of Canada and its departmental elements, on the employer, namely Treasury Board, with its personnel administration regulations and guidelines and DND with its Civilian Personnel Administrative Orders (CPAO).

The focus of the research assignment is on the role and environment of the first line officer involved in civilian personnel administration at local Canadian Force Base Level.

ADM 493 **Computing Science Project** 0-5-5

For Fourth Year students of the Computing Science option, in the Management orientation.

A computer related project, typically a programming effort in a particular area of Computing Science related to the Management orientation. Two periods are reserved on the schedule at the first session for this project and three at the second session. A report and an oral presentation must be given at the end of the year.

Seminars 0-3-6

The objective of the seminars in administration is to complement the regular curriculum in exposing the most recent developments in a particular field to the students.

Guest speakers are usually managers from the private, public or military sectors, or professors of other universities. They are chosen for their distinction and expertise in a specific field of administration sciences.

DEPARTMENT OF CHEMISTRY

Head of the Department	Joseph Zauhar, BSc, MSc, DSc, PChem
Professors	Robert Lavigne, BSc, MSc, DSc, PChem
	James L. Thompson, BA, MA, PhD, PChem
Associate Professors	Sreenivas Ashtakala, BSc, BChE, MASc, PhD
	Fernand Bissonnette, BSc, MSc, PhD, PChem
	Jean-Louis Ferron, BSc, MSc, PhD
	Bernard Ostiguy, BA, BSc, MSc, PhD
Assistant Professor	Gilles Caron, BSc, MSc, PhD, PChem

202-111 **General Chemistry** 3-2-4

For students that have completed only one full year course in chemistry at the secondary school level.

The course is intended to provide the student with the elements of chemistry which have not been sufficiently covered in high school, with the intention to prepare the latter for the more advanced general chemistry course 202-101.

Matter. Atoms and molecules, atomic theory, symbols and formulas, atomic and molecular masses. Laws of chemistry, the mole concept. Atomic structure and isotopes. Classification of the elements. The gaseous phase and the laws of gases: ideal gases, partial pressures and diffusion. Formation of compounds: transfer and sharing of electrons, the octet rule, ionic and covalent bonds, nomenclature, empirical and molecular formulas. Chemical reactions: definition, equations and balancing of equations, types of reactions, interpretation of an equation and stoichiometric calculations. Energy of a reaction: endothermic and exothermic reactions, enthalpy, heats of formation, combustion, fusion, solution. Solutions: definition, qualitative and quantitative expressions for concentrations.

Experiments on the basic principles of chemistry acquired in the lectures while allowing the student at the same time to become acquainted in the use of simple laboratory apparatus.

Textbooks:

Kroschwitz and Winokur, Chemistry: A First Course
O'Connor, Davis, Haenisch, MacNab et McClellan, La Chimie: Expériences et principes

202-101 **General Chemistry** 3-2-4

For students of the Preparatory year who have completed two full year courses in chemistry at the secondary level, or who have completed Chemistry 202-111.

CHEMISTRY

This course expands the student's basic knowledge of chemistry and together with Chemistry 202-201, prepares him for studies in engineering, science or other related fields.

Foundations of the atomic theory of matter, wave-mechanical atom, periodic law, chemical bonding, stereochemistry, chemical properties and chemical bonds, gas phase, liquid phase, solid phase and phase changes. Stoichiometry and the basis of atomic theory. Modern atomic theory: elementary structure of the atom, quantum theory, elementary quantum mechanics, quantum numbers, atomic orbitals. Periodic table: electronic structures of elements (Pauli principle, Hund's rule, Aufbau principle), periodic properties of elements. Chemical bonds: ionic and covalent bonds, polarity of bonds, hydrogen bonding, metallic bonding, Van der Waals forces. States of matter: gas laws, crystal lattices, liquids, phase changes.

Selected experiments are performed to illustrate the lecture material. Emphasis is placed on the precision of measurements and logical deduction

Textbooks:

Russell, General Chemistry
Tournier, Chimie générale, Vol. 1

202-201 **Solution Chemistry** 3-2-4
PA 202-101

For students following the science and engineering programmes.

This course provides the student with a sound knowledge in: solutions, chemicl equilibria and other related properties and to introduce concepts on chemical kinetics and electrochemistry.

Solutions. Colloidal state. Chemical kinetics. Chemical equilibrium. Electrochemistry and Faraday's law. Ionic equilibrium: pH, buffer solutions, precipitation theory. Oxidation-reduction.

Laboratory work includes experiments in volumetric analysis, pH, colligative properties and colorimetry during which the students learn the use of modern analytical equipment.

Textbooks:

Russell, General Chemistry
Rosenburg, College Chemistry

203-927 **Physical Sciences** 3-0-3
PA 202-101

For students in the Administration Sciences or Humanities programmes of study.

The purpose of the course is to complete the science formation of officer-cadets destined for the non-scientific options. The course is designed to have the students appreciate the fundamental nature of science in general and to provide them with useful and practical knowledge in both chemistry and physics.

Chemistry of the atmospheric environment. Principal types of pollutants: CO_x, SO_y, C_xH_y, N_xO_y. The automobile as source of pollution. Chemistry of the water environment. Sources of pollution and classes of pollutants. Eutrophication. B.O.D. Procuring potable water. Treatment of waste waters. Pesticides. Mercury in the environment.

Textbooks:

Pryde, Environmental Chemistry
Moore and Moore, Environmental Chemistry
Readings of the Scientific American, Chemistry of the Environment

CHM 241 **Physical Chemistry** 3-0-6
PA 202-201

Ideal gas law. Kinetic theory of ideal gases. Deduction of the empirical gas laws. Applicability of the ideal gas laws and the van der Waals equation. Specific heats of gases. Critical phenomena of liquids. Andrews isotherms. Van der Waals constants. First and second laws of thermodynamics. Thermochemistry. Fuels and combustion.

Textbook:

Maron and Lando, Fundamentals of Physical Chemistry

CHM 242 **Physical Chemistry** 3-0-6

Entropy and free energy. Partial molar quantities. Activity concept. Phase equilibrium. Colligative properties. Electrochemistry. Electromotive force and thermodynamics. Corrosion of metals and corrosion protection.

Textbooks:

Maron and Lando, Fundamentals of Physical Chemistry
Evans, An Introduction to Metallic Corrosion

CHM 252 **Physical Chemistry Laboratory** 0-3-6
PR CHM 241

Determination of the density of a vapour. Temperature dependence of vapour pressure. Heat of vaporization. Heat of reaction. Transition point. Phase diagram of a binary system. Ternary diagram.

Electrode potential. Electrochemical cells. Concentration cells. Thermodynamics of cells. Potentiometric titration.

CHM 261 **Inorganic Analytical Chemistry** 1-2-6
PA 202-201

Review of basic concepts. Complex compounds: nomenclature, structure of complexes, stability. Solubility product, effect of pH on precipitation. Elements of oxidation-reduction reactions. Scheme for qualitative analysis.

Semimicro qualitative analysis. Scheme for cations. Tests for anions.

Textbook:

Sorum, Introduction to Semimicro Qualitative Analysis.

CHM 321 **Organic Chemistry** 2-2-5
PR CHM 241, CHM 242,
CHM 252, CHM 262

Properties of organic compounds. Functional groups and nomenclature. Stereochemistry: molecular conformation, positional, functional, geometric and optical isomerism, stereochemistry of cycloalkanes

Identification of different functional groups by semimicroanalysis.

Textbooks:

Morrison and Boyd, Organic Chemistry
Owen, Characterization of Organic Compounds

CHM 322 **Organic Chemistry** 2-2-5
PR CHM 241, CHM 242
CHM 252, CHM 262

Structural effects in organic molecules. Acids and bases. Energy profiles of organic reactions. Reaction intermediates. Types of reagents. Fundamental types of organic reactions: addition, substitution, elimination reactions. Organic functional groups.

Experiments in organic synthesis: cyclohexene, adipic acid, n-butyl bromide, nitrobenzene, aniline, sulphanilic acid, etc.

Textbooks:

Kemp, Practical Organic Chemistry
Morrison, Boyd, Organic Chemistry

CHM 341 **Physical Chemistry** 2-2-5
PA CHM 241, CHM 242, CHM 252

Review of fundamental concepts. Electrical units. Mechanism of electrolysis. Faraday's laws. Ionization theory. Conductivity. Transference number. Ionic mobilities. Thermodynamic properties of ionic solutions. Solubility. Theories on ionic conductivity. Ionic and thermodynamic equilibria. Activity and fugacity.

Experiments on conductivity of electrolytic solutions, transference number (Hittorf's method), transference number (moving boundary method), potentiometric and conductometric titrations.

Textbooks:

Moore, Physical Chemistry
Souchay, Thermodynamique chimique

CHM 342 **Physical Chemistry** 2-2-5
PA CHM 341

Electrochemical cells. Electrode potentials. Thermodynamics of cells with transference and without transference. EMF and the activity coefficient. Classification of cells. Polarization. Overvoltage. Order of a raction. Activation energy. The Arrhenius equation. Collision theory. Homogeneous catalysis.

Experimental work on coulometry, electrode potentials, thermodynamics of cells, equilibrium constant, first and second order reactions.

Textbooks:

Moore, Physical Chemistry
Souchay, Thermodynamique chimique

PHY/CHM 399 **Technology of Weapons** 3-0-6
PR 203-927

History. Use of chemicals in war. Modern arsenal of chemical weapons. Use of chemical weapons. Toxicity of chemicals on man and plants. Biological and chemical action of gases and toxins on living organisms. Future of chemical weapons. Chemical industry of a country and its potential for producing chemical weapons. Strategic materials: elements and chemical compounds essential to waging war, vulnerability of a country with respect to these strategic materials.

CHM 421 **Organic Chemistry** 2-2-5
PA CHM 321, CHM 322

Chemistry of organometallic compounds. Chromatography, Infrared spectroscopy.

CHEMISTRY

Organic syntheses illustrating the following reactions: acylation, elimination, ether formation and identification of organic compounds by chromatography and i.r. spectroscopy.

Textbooks:

Coates, Organometallic Compounds
March, Organic Chemistry
Pavia, Lampman and Kriz, Introduction to Spectroscopy
Swinehart, Organic Chemistry — An Experimental Approach

CHM 422 **Organic Chemistry** 2-2-5
PA CHM 321, CHM 322

Elements of macromolecular chemistry. Ultraviolet-visible and nuclear magnetic resonance spectroscopy.

Laboratory work on Grignard reactions, free radical reactions. Kinetics of displacement reactions, Diels-Alder reaction and identification of organic compounds by i.r., u.v., n.m.r. and chromatography.

Textbooks:

Champetier et Monnerie, Chimie macromoléculaire
Pavia, Lampman and Kriz, Introduction to Spectroscopy
Pastro and Johnson, Organic Structure Determination
Swinehart, Organic Chemistry — An Experimental Approach

CHM 441 **Physical Chemistry** 2-2-5
PA CHM 241, CHM 242

Review of the principal thermodynamic relations applicable to closed systems. Applications to real systems. Open systems. Partial molar quantities. Activity and fugacity concepts with application to solutions. Apparent molar quantities. Methods of measurement. Thermodynamics of open systems. Heterogeneous systems.

Selected experiments on calorimetry, measurement of the heat of solution, fractionating columns, colligative properties of solutions, ebullioscopy and cryoscopy, measurement of solute activity, polarography, surface tension. I.r. and u.v. spectroscopy and spectrophotometry.

Textbooks:

Moore, Physical Chemistry
Souchay, Thermodynamique chimique

CHM 442 **Physical Chemistry** 2-2-5
PA CHM 341, CHM 342, CHM 442

Homogeneous kinetics. The phase rule and its applications. Heterogeneous kinetics. Introduction to statistical thermodynamics.

Laboratory work consists of experiments on mass spectrometry, differential thermal microcalorimetry, polarimetry, absorption, determination of the partial molar quantities of solutions, osmotic pressure of polymeric solutions, intrinsic viscosity of polymeric solutions and monomolecular films.

Textbooks:

Moore, Physical Chemistry
Souchay, Thermodynamique chimique

Tutorials

The department of chemistry offers tutorials to students who have either failed an examination or have shown insufficient progress during an academic session. Students following such tutorials obtain supplementary explanations and do additional exercises so as to attain an acceptable level of proficiency. Preparatory and First year students are obliged to attend tutorials, while for those in more advances classes, the decision to attend rests with the professor.

Seminars

Within the framework of the seminars organized by the Science and Engineering division, the department of chemistry invites professors and researchers from the College and from outside to speak on topics related to their own speciality. These seminars, often of military interest, are an essential complement to the students regular courses and thus contribute substantially to their university education.

Research

Scientific research in the department of chemistry is directed mainly in four areas: photolytic organic synthesis, thermodynamics of bi- and trimetallic alloys, study and control of the environment and synthesis and characterization of organic and organometallic semiconductors. Researchers in the latter field are active particpants in le Groupe de recherche sur les semiconducteurs et les diélectriques, a research group composed of physics and chemistry professors from CMR and l'Université de Sherbrooke. Students in the Fourth year of the general B.Sc. programme may, if they so desire, select a term research project in any of the above mentioned fields. The work is done under the supervision of a member of the department and upon termination, each student must prepare a dissertation and give an oral presentation of his results.

DEPARTMENT OF COMPUTER SCIENCES AND ENGINEERING

Head of the Department	Robert Gervais, BA, BSc, MSc, PhD (Math), MSc, (Info)
Assistant Professors	C.K.S. Chong Hok Yuen, BSc, PhD Captain Y. Dugal, BEng, MEng Major N.E. Lee, CD, BEng, MEng Bernard Mongeau, BSc, MSc A, DSc A, Ing (part time) Marielle Vaillancourt, BSc, MSc
Lecturers	Jocelyn Desbiens, BSc, MSc (part time) Captain D.C. Pettigrew, CD, BEng Captain R. Robert, CD, BEng.

201-408 **Numerical Methods** 3-2-6
PA 201-103, 201-105

For First Year students who select Sciences or Engineering.

Introduction to scientific problem solving and structured programming using FORTRAN-77.

The course leads to the use of library subroutines to apply such numerical methods as: roots of equations, solution of simultaneous linear equations, numerical integration, interpolation and curve fitting.

Textbooks:

Friedman & Koffman, Problem Solving and Structured Programming in FORTRAN
Stark, P.A., Introduction to Numerical Methods
Vazsonyi, A., Introduction to Electronic Data Processing

ING 210 **Engineering Graphics I** 1-2-3

For the Second Year students who select Engineering, Chemical Engineering or Science (Applied).

This course is designed to acquaint the student with the use of Engineering Drawing as a means of communication.

The course covers use of instruments; sketching, orthographic views; geometric constructions; use of scales, lettering,; auxiliary views; sections; pictorials; tolerances and dimensioning; production drawings. It also includes a practical design project where the student must apply graphics as well as the fundamental steps of the design process.

Textbook:

French, T.E., and Vierck, C.J., Fundamentals of Engineering Drawing and Graphic Technology

COMPUTER SCIENCES AND ENGINEERING

ING 220 **Engineering Graphics II** 1-2-3
PA ING 210

For the Second Year students of the Engineering option.

This course deals with graphical methods of solving three-dimensional or space problems.

This course covers points and lines; true length, parallel, perpendicular and intersecting lines, bearing and slope; plan surface, strike and dip, shortest distances, true sizes and angle relationship of lines and planes, perpendicular lines and planes, revolution; single curved, double curved and warped surfaces; intersections of planes and polyhedrons; development. At all times emphasis is given to solution of practical engineering project.

Textbook:

Wellman, B.L., Technical Descriptive Geometry

ING 230 **Strength of Materials** 3-1-5
PA 201-103, 201-105, 203-101

For the Second Year students who select Engineering or Chemical Engineering.

Introduction to basic concepts of strength of material in order to find dimensions of simple elements.

Review of statics, mechanical properties of materials, stress and strain in axially loaded members; axial force, shear and bending moment diagrams; elastic and inelastic torsion of circular members; bending and shearing stresses in beams; compound stresses; analysis of plane stress; principal stresses; Mohr's circle for plane stress; combined loading. Laboratory experiments include tension, torsion and flexture tests.

Textbook:

Popov, Introduction to Mechanics of Solids

INF 251 **Introduction to Business Data Processing** 3-0-6

For Second Year students of the Administration, Canadian Studies, and Military and Strategic Studies options.

Introduction to basic concepts of computer and application in business.

This course gives a systematic approach to problem solving in management and to structured programming using FORTRAN 77. The emphasis is on applications and concepts related to the courses in Administration.

Textbooks:

Friedman and Koffman, Problem Solving and Structured Programming in FORTRAN
Brabb and McKean, Business Data Processing

INF 351 **Computer Science in Administration** 3-0-6
PA 201-408 or
INF 251

For Third Year students of the Administration option and Fourth Year students of the Computing Science option.

Familiarize the student with intermediate concepts of business data processing and how to solve appropriate related problems in structured COBOL.

Concepts of operation of a computerized system: record classification, transaction validation and updating of sequential and indexed files. Introduction to data base techniques with an overview of some management information systems. This course is essentially based on the use of the computer through practical exercises written in structured COBOL.

Textbooks:

Kazmier & Philippakis, Structured COBOL
Vazsonyi, A., Introduction to Electronic Data Processing

INF 361 **Computer Architecture and Assembler Programming** 3-0-6

For Third Year students of the Computing Science option.

Introduction to small computer and assembly language programming.

Organization and architecture of small computers. Programming in assembly language including subroutine, linkages and macro-assembler. Addressing techniques, input and output programming. Simple data structures.

Textbook:

Wakerly, J.F., Microcomputer Architecture and Programming

INF 362 **Mini-Computer Systems** 3-0-6
PA INF 361

For Third Year students of the Computing Science option.

The course presents a functional description of computer hardware concepts and current technology.

A study of hardware and software structures. Processor architecture, input/output architecture and operating system

components. Interfacing and data capture in real time processor. Cluster, network and multiprocessor designs. Real time executive systems. Hands on access to mini-computer systems using assembler language programming.

Textbook:

MacEwen, G.H., Introduction to Computer Systems

INF 363 **Structured System Analysis** 3-0-6
PR MAT 381

For Third Year students of the Computing Science option.

The course is designed to familiarize the student with information systems enabling him to modify such systems, to design one from the user's needs and to be able to maintain an implemented system.

Preliminary analysis, feasibility study; modular design, top-down design, information system design; implementation, modification and documentation.

Textbook:

Lesson, M., Systems Analysis and Design

INF 371 **Teleprocessing** 3-0-6
PA MAT 381, INF 361

For Fourth Year students of the Computing Science option.

Familiarize the student with the principles of the analysis and design of computer networks with emphasis on the ISO model of network architecture.

A study of remote control of computers. Categories of data transmission systems; channel capacities; communication; line characteristics, modems, concentrators and multi-points drops, coding systems, transmission modes, transmission errors and recovery schemes. Network structures. Transmission protocols. Terminal, control units, programmes and software.

Textbooks:

Tanenbaum, Computer Networks
Dixon, R.D., Data Communications: Facilities, Networks and Systems Design
Martin, J., Computer Networks and Distributed Processing

INF 441 **Compiler** 3-0-6
PA MAT 381

For Fourth Year students of the Computing Science option.

This course familiarizes the student with basic concepts of compiler and its elaboration.

Introduction to the systematic construction of a compiler. Grammar and language-scanners, top-down and bottom-up parsing, run-time organization, symbol tables, syntax trees, semantic routines, storage administration, code generation and optimization. Error detection and recovery.

Textbook:

Aho & Ullman, Principles of Compiler Design

INF 442 **Data and File Structures** 3-0-6
PA MAT 381

For Fourth Year students of the Computing Science option.

The course familiarizes the student with different data and file organizations including their manipulation.

Introduction to data and file organization. Concepts of type and structure of information. Study of manipulation in stacks, queues, linked lists and trees. Management of memory space. Internal and external sorting. Hashing storage: packing and unpacking of data; study of file organization.

Textbook:

Horowitz & Sahni, Fundamentals of Data Structures

INF 443 **Data Base Management Systems (DBMS)** 3-0-6
PA INF 442

For Fourth Year students of the Computing Science option.

Introduction to database concepts including the relational, hierarchical and network models of data.

A study of modern data base systems and organizations. Analysis of file structures and types; concepts of data models, data language, data security and data integrity. The organization, storage search and retrieval methods associated with hierarchical network and relational data models.

Textbook:

Data, An Introduction to Database Systems

INF 461 **Operating Systems** 3-0-6
PA INF 361, INF 362,
MAT 381
CR INF 442

For Fourth Year students of the Computing Science option.

This course presents the principles of operation of the major modules of an operating system in a multiprogramming context.

Comparison between different types of operating systems. Multiprogramming principles; P and V primitives and dispatcher; interrupts and memory management, input/output management, files and jobs management; protection and security.

Textbook:

Lorin & Deitel, Operating Systems
Lister, Principes fondamentaux des systèmes d'exploitation

INF 471 **Computer Graphics** 3-0-6
PA MAT 381

For Fourth Year students of the Computing Science option.

This course is an introduction to computer graphics and display devices, to raster scanners and storage tube.

Display memory, generation of primitives: points, vectors and texts. Interactive versus passive graphics; input devices like light pen, tablet, etc.; graphic languages, display list, mathematics of two and three dimensional transformations, projections, segmentation and hidden line removal.

Textbook:

Foley, J.D. & Van Dam, A., Fundamentals of Interactive Computer Graphics

INF 493 **Computing Science Project** 0-5-5

For Fourth Year students of the Computing Science option, in the Systems orientation.

A computer related project, typically a programming effort in a particular area of Computing Science related to the Systems orientation. Two periods are reserved on the schedule at the first session for this project and three at the second session. A report and an oral presentation must be given at the end of the year.

Seminars

The Departments of the Division of Science offer their students a series of conferences, once a week. These conferences are given by qualified professors and researchers, each of whom will discuss his field of specialization as well as its present state and needs.

This series of seminars is an essential complement to the regular courses. The program also includes visits to industries and laboratories, visits which are often of military interest as well.

DEPARTMENT OF LITERARY STUDIES

Head of the Department	Gilbert Drolet, BA, MA, PhD
Professors	Peter Aichinger, BA, BA(Hons.), MA PhD
	Roch Carrier, BA, MA, DU
	Agop Hacikyan, N.D.C., BA, MA, PhD
	René Labonté, BPéd. BA, MA, PhD
Associate Professors	Adnan Moussally, L ès L, MA. D ès L
	Guy Provost, BA, MA D ès L
	Mohammad Tajuddin, BA, MA, PhD
	Florent Tremblay, BA, BEd, MA, PhD
Lecturers	Yves Barbarie, BA, MA, PhD
	Sylvie Gagné, BSpEL, MA, L Sc hum

603-110 3-0-6

The course consists of a review of the fundamentals of composition and an introduction to the methods of research, as well as a study of selected literary works. Students are required to write a series of short papers during the term.

603-210 3-0-6

The course consists of an introduction to poetry and the study of selected literary works including one Shakespeare play and two novels. Students write a term paper as well as several short essays.

603-310 3-0-6

A study of selected works of modern literature including two novels, one or two plays, short stories and poems. A term paper and short essays are required.

603-410 3-0-6

The course includes at least one Shakespeare play, two novels and a selection of shorter literary works. Students write a term paper and several short essays.

ENG 211 2-0-4

The course is based upon the study of five or six works of Utopian literature including Bellamy, Looking Backward; Huxley, Brave New World; Orwell, 1984; Golding, Lord of the Flies; Vonnegut, Player Piano; and Kesey, One Flew Over the Cuckoo's Nest.

LITERARY STUDIES

ENG 212 3-0-6

The course is the last part of a five-part survey of English, American and Canadian literature. While it consists mainly of novels, some time is also devoted to the study of poetry and the short story.

ENG 251 **Communication and Writing Skills** 3-0-6

The course focuses upon oral communication and writing skills adapted to the needs of the students. It covers the grammatical aspects, pausing to study the language of business, and to offer certain models as a guide for the students, while requiring that the students prepare several practical exercises both written and oral.

ENG 301 **Canadian Literature in English I: The short story** 3-0-6

This course examines the story as a genre in its particular Canadian context. It traces the chronological development of this form in Canada, but the thematic and comparative aspects are also emphasized.

ENG 302 **Canadian Literature in English II: The novel**

A study of the Canadian novel in English from the earliest times to the present day. The course focuses upon the principal themes of a selection of major Canadian novelists.

ENG 401 **Canadian Literature in English III: Poetry** 3-0-6

A study of the themes and techniques which characterize the principal Canadian poets whose work has appeared in English from the earliest times to the present day. Regional poets will be invited to read their work and participate in seminars.

ENG 402 **Canadian Literature in English IV: Drama, film, and television** 3-0-6

This course concentrates upon the themes treated by the principal Canadian playwrights and directors working in English. Attendance at theatre and film productions in the Montreal region is part of the course. Where possible, local directors and writers will be invited to participate in seminars.

601-102 **Poésie** 3-0-6

Ce cours initie l'étudiant au langage poétique comme moyen de communication. Il l'amène à une maîtrise minimale des techniques de

ce discours par la lecture, l'analyse de différents types de poèmes et la création.

601-902 **Éléments de linguistique** 3-0-6

Décrire les mécanismes fondamentaux de la langue. Identifier et "catégoriser" les faits de la langue en fonction du français international, du franco-québécois et des particularités régionales. Donner à l'étudiant la possibilité de se situer face aux différents niveaux de langue. Faciliter le maniement de la langue comme moyen de communication. Le franco-canadien sert d'approche à chaque domaine de la linguistique: sémantique, phonétique, morphologie et syntaxe souci de dégager les implications linguistiques est constant. Une importance particulière est accordée à la morpho-syntaxe pour sa dimension structurale ainsi qu'aux niveaux de langue. L'importance accordée au phénomène franco-canadien implique qu'on se préoccupe du français international et de l'anglo canadien.

601-911 **Français écrit** 3-0-6

Ce cours a pour but d'aider l'étudiant à améliorer sa langue écrite. Il lui apprend à utiliser les mots dans leurs sens propre, construire des phrases correctes, former des paragraphes logiques et rédiger un texte cohérent. Ce cours est destiné aux étudiants qui y ont été dirigés après un test.

601-302 **Roman** 3-0-6

Par la lecture et l'analyse de romans, l'étudiant découvre des aspects particuliers d'époques et de sociétés diverses. Il suit l'évolution des idées de progrès et de liberté. Il developpe une compréhension des techniques du roman et une capacité d'en dégager l'idéologie sous-jacente. Il approfondit son aptitude à la lecture tout en améliorant sa langue écrite.

601-402 **Essai** 3-0-6

Ce cours, axé sur la pratique de la langue et sur des habiletés à acquérir, vise à développer la compétence à communiquer surtout par l'écrit. L'élève officier devra lire et comprendre des discours de type informatif, explicatif, argumentatif et critique. Il devra aussi produire des textes exprimant surtout des idées: dissertation, compte rendu et analyse de texte.

FRA 206 **Littérature québécoise** 2-0-4

Ce cours fait connaître aux étudiants du programme de sciences et ingénierie un choix d'œuvres qui témoignent de l'histoire du Can-

ada français et de sa volonté d'affirmer son identité. Il se propose de saisir la cohérence et la signification de chacun des romans analysés et d'en dégager l'idéologie sous-jacente par la confrontation des données romanesques avec les réalités historique et sociale.

FRA 208 **Littérature québécoise** 3-0-6

Ce cours fait connaître aux étudiants des programmes d'administration, d'études canadiennes et d'études militaires et stratégiques, un choix d'oeuvres qui témoignent de l'histoire du Canada français et de sa volonté d'affirmer son identité. Il se propose de saisir la cohérence et la signification de chacun des romans et des poèmes analysés et d'en dégager l'idéologie sous-jacente par la confrontation des données romanesques et poétiques avec les réalités historique et sociale.

FRA 251 **Communication et techniques de rédaction** 3-0-6

Ce cours vise à améliorer la communication orale et écrite des étudiants en s'adaptant à leurs besoins. Il touche à l'aspect grammatical du langage, s'attarde à l'étude de la langue des affaires, propose des modèles pour guider les étudiants et exige d'eux plusieurs travaux pratiques, écrits et oraux.

LIT 340 **L'expérience militaire selon les écrivains canadiens** 3-0-6

Ce cours se propose d'analyser, dans la littérature d'imagination, les oeuvres qui enregistrent et reflètent les principaux évènements militaires vécus par les Canadiens. Il examine l'essence de la guerre, ses effets sur la société canadienne et met en évidence l'évolution des attitudes des deux solitudes.

FRA 301-302-401-402 **Littérature québécoise** 3-0-6

Ces cours sont offerts aux étudiants inscrits au programme d'études canadiennes et se proposent de cerner le phénomène littéraire dans ses rapports avec l'évolution de l'idéologie et de la société québécoise. Les oeuvres étudiées (romans, essais, contes, pièces de théâtre, nouvelles et poèmes) sont groupées à l'intérieur des quatre périodes suivantes : (FRA 301) de la Nouvelle-France à 1914; (FRA 302) de 1914 à 1945; (FRA 401) de 1945 à 1960 et (FRA 402) de 1960 à nos jours.

DEPARTMENT OF MATHEMATICS

Head of the Department	Marcel Labbé, BA, MA, PhD
Professors	Jean-Maurice Jarry, BA, LSc, LPéd, MSc
	Michel Jean, BA, BSc, MA, PhD
	Philip J Laufer, BSc, MSc, PhD
Associate Professors	Robert Gervais, BA, BSc, MSc, PhD (Partial time)
	Gheorghe Isac, LSc, PhD
	Jean-Claude Ladouceur, BSc, MSc
	Pierre Laviolette, BSc, MSc, PhD
	Gérard Normand, LSc, BSc, MSc
	Jean-Paul Rivet, BSc, MA
Assistant Professors	François Dubeau, BSc, BScA, MScA, PhD
	Jean-Guy Dubois, BPéd, BSc, MSc, PhD
	Paul Flanagan, BScA, MA
	Claude Gauthier, BSc, MSc, PhD
	Jacques Gélinas, BA, BSc, MSc, PhD
	Pierre Gravel, BMat, MMat, PhD
	Daniel Hennequin, BSc, MSc, PhD
	Fernand Ledoyen, BA, BSc, DSc (Partial time)
	Jean Savoie, BSc, MSc, PhD
Lecturers	Jean-Charles Bernard, BSc, MSc
	Jocelyn Desbiens, BSc,MSc

201-101 **Introduction to Applied Mathematics** 3-2-4

The object of the course is to provide the student with the necessary background to use the principal concepts of algebra, trigonometry and geometry efficiently. These basic concepts are prerequisites for subsequent courses in applied mathematics. This course is compulsory for all preparatory year students.

Review: exponents, radicals, complex fractions. The straight line in analytic geometry. Quadratic functions and inequalities. Systems of linear equations, the Gauss-Jordan elimination process. Linear programming. Trigonometry. Complex numbers. Synthetic division, remainder theorem, rational roots. Conic sections. System of quadratic equations. Arithmetic and geometric progressions. Permutations, combinations, binomial theorem.

TEXTBOOK:

Keedy-Bittinger, Fundamental Algebra and Trigonometry (2nd Edition)

MATHEMATICS

201-103 **Differential and Integral Calculus I** 3-2-4

The course has for objective to initiate the student to the fundamental concepts of the differential and integral calculus: limit, derivative and anti-derivative. Classical applications such as optimization, graphs, computation of areas and volumes are largely discussed. This course is compulsory for all preparatory year students.

Review: real numbers, geometric representation. Inequalities and absolute values. Review: relations, functions, geometric representation; domain, range, asymptotes. Limit, theorems on limits, derivative, geometrical interpretation, one-sided limits, limits at infinity, continuity, sequences. Properties of derivatives, derivatives of algebraic functions, implicit differentiation. Applications of derivatives: variations of a function, max and min problems, problems on related rates. The differential. Summations. Area, definite integral, evaluation by the fundamental theorem. Area between two curves. Differentiation and integration of trigonometric and inverse trigonometric functions. functions. Logarithmic functions, exponential functions: differentiation and integration, applications.

TEXTBOOKS:

Protter-Morrey, Calculus with Analytic Geometry: A First Course (3rd Edition).
Gilles Ouellet, Calcul I.

201-105 **Introduction to Linear Algebra** 3-2-4

The course has for objective to initiate the student to the fundamental concepts of linear algebra: vector, matrix and determinant, vector space. The geometry of the line and of the plane in space is largely studied. The course is compulsory for all preparatory year students.

Lines and circles in E_2. Vectors in E_2 and E_3, scalar and vector products. Planes, lines and spheres in E_3. Conics and quadrics. Vector space, subspace, linear dependence, basis, dimension, systems of linear equations. Coordinate systems in E_3, rotations in E_2. Matrices, matrices and systems of linear equations, inverses, determinants.

TEXTBOOKS:

H. Anton: Elementary Linear Algebra (3rd Edition).
Blouin, Davesne, Giard, Laliberté et Lavoie: Algèbre linéaire et géométrie.

201-203 **Differential and Integral Calculus II** 3-2-4
PA 201-103

The course is a complement of integral calculus. The objective is to prepare the student to use the concepts of integral, sequence and

series as tools for subsequent courses of a quantitative nature. The course is compulsory for all first year students.

Rolle's theorem and the mean value theorem, the Cauchy formula, l'Hospital's rules. Sequences: definition of convergence, operations on convergent sequences. Series: definition of convergence, the main convergence tests, power series, the Maclaurin and Taylor series. The Riemann integral: definition and properties, evaluation by using the Fundamental Theorem. Methods of integration. Calculation of areas and volumes. Separable differential equations and first order linear differential equations.

TEXTBOOK:

Protter-Morrey, Calculus with Analytic Geometry: A First course (3rd Edition).

MAT 212 **Linear Algebra** 3-1-5
PA 201-105

Vector space, subspace, linear dependence, basis, dimension. Change of basis. Elementary matrices, inverses. Linear transformations, matrix of linear transformation, effect of a change of basis. Determinants. Eigenvalues and eigenvectors. Characteristic polynomial. Equivalence and similarity. The Hamilton-Cayley theorem. Orthonormal basis and orthogonal transformations. Rotations and reflections in E_3. Quadratic forms, diagonalization of symmetric real matrices by means of orthogonal transformations. Convex sets. Linear programming: introduction, simplex.

MAT 221 **Differential and Integral Calculus III** 3-0-6
PA 201-203

Quadric surfaces and translations. Functions of several variables: limit, continuity, partial derivatives, chain rule, directional derivative, gradient, total differential, Taylor's theorem with remainder, maxima, minima, Lagrange multipliers. Double integral: properties, evaluation, applications: area, mass, density. Polar, cylindrical, spherical coordinates, applications: center of mass, moment of inertia. Triple integral and applications: mass of a solid, center of a mass and moment of inertia. Triple integral: cylindrical, spherical coordinates.

MAT 222 **Differential and Integral Calculus IV** 3-0-6
PA MAT 221

Parametric equations: graph, derivative, arc length. Hyperbolic functions, inverse. Functions of a vector, curves in E_3, tangent vectors normal and tangential vectors, arc length. Exact differential, line inte-

gral. Path independence. Differential equations: definition, particular and general solution. First order differential equations: separable variables, homogeneous, exact, integrating factor, linear, of Bernoulli, of Clairaut. Applications. Second order differential equations: variable coefficients of special forms, applications. Linear differential equations of the second order with constant coefficients, homogeneous, nonhomogeneous, higher order, undetermined coefficients, variation of parameters methods, Wronskian and applications.

MAT 223 **Differential and Integral Calculus V** 3-0-6
PA MAT 221

Periodic functions, Fourier series, half-range expansions. Fourier integral. Laplace transforms. Application to ordinary differential equations. Vector fields, divergence, curl. Green's theorem. Representations of surfaces, tangent planes, first fundamental form, surface integrals. The divergence theorem. Stokes' theorem and independence of path in a line integral.

MAT 251 **Probability and Statistics** 3-0-6
PA MAT 221

Definition and purpose of mathematical statistics. Tabular and graphical representation of samples. Sample mean and variance. Random experiments, events. Probability. Permutations, combinations. Random variables. Discrete and continuous distributions. Mathematical expectation and variance. Binomial distribution, Poisson and Hypergeometric distributions. Normal distribution. Distribution of several random variables. Random samples and random numbers. Estimation of parameters. Confidence intervals. Tests of hypothesis.

MAT 312 **Numerical Methods in Linear Algebra** 3-0-6
PA MAT 222; MAT 223

Review: vector spaces, dual space, normed and inner product spaces. Numerical solution of systems of linear equations, direct and iterative methods, the LU decomposition. Pseudo-inverses, singular value and AR decomposition of a matrix; application to least square fitting of curves. Eigenvalues, eigenvectors and canonical form of a matrix. Use of Eispack.

MAT 321 **Differential Equations** I 3-1-5
PA MAT 222

Concept of differential equation, general solution and interpretation. Classical differential equations of first order: separable, linear, homogeneous, Bernoulli, Riccati, Clairaut, Lagrange, exact, integrating factor. Singular solution. Applications and construction of

models. Existence theorem and unicity. Differential equations of order n, $n \geq 2$, special forms, linear of order n, the Wronskian, linear of order n with constant coefficients, homogeneous and non-homogeneous, undetermined coefficients and variation of parameters. Linear second order differential equations with variable coefficients. The Ostrogradski-Liouville method. Applications. Linear differential systems. The eigenvalues method and solution of linear non-homogeneous differential systems and applications.

MAT 322 **Differential Equations II** 3-1-5
PA MAT 321

Differential equations of order two as oscillating phenomena. Qualitative analysis of second order and linear differential equations with variable coefficients. Comparison theory of Sturm-Liouville and related problems of regular and singular types. Eigenvalues, eigenfunctions. Fourier analysis related to Sturm-Liouville problems. Analysis of second order and linear differential equations with analytic coefficients by series and solutions at singular points. Orthogonal polynomials, gamma function, Bessel functions, Jacobi functions and Legendre, Laguerre and Hermite functions. Elements of the calculus of variations. Euler equation. Applications.

MAT 326 **Complex Variables** 3-0-6
PA MAT 328

Complex numbers, geometric representation. Analytic functions. Elementary functions, transformations, multiple-valued functions, introduction to Riemann surfaces. Integration in the complex plane. Series, Taylor and Laurent series, singularities. Residues and applications, integration around a branch-point. Conformal mapping. Boundary value problems.

MAT 325 **Differential Equations I** 3-0-6
PA MAT 222

The concept of differential equation (nature and origin). Problems on differential equations, general solution and geometric interpretation. First order classical differential equations and applications. Existence theorem and unicity (statement and use of). Second order, linear (homogeneous and nonhomogeneous) differential equations: methods of undetermined coefficients and variation of parameters. The Ostrogradski-Liouville method. Linear second order differential equations with analytic coefficients. Method of solution using series.

MAT 327 **Differential Equations II** 3-0-6
PA MAT 326

Calculus of variations: Euler's equation and applications. Systems of linear differential equations. Analysis of the space solution.

The eigenvalues method. Systems of nonlinear differential equations. Volterra's prey-predator system, autonomous system. Stability, function of Liapunov. Periodic solutions and applications to nonlinear mechanics. Laplace transform and applications.

MAT 328 **Analysis I** 3-0-6
PA MAT 221

Real sequences. Continuity of a real function of one or two real variables. Continuity: function of a complex variable. Conditions for analyticity. Complex integration. Complex sequences and series. Uniform convergence. The residue theorem. Evaluation of improper real integrals.

MAT 329 **Analysis II** 3-0-6
PA MAT 328

Uniform convergence of improper integrals depending on a parameter. The B-function. The Fourier transform and its applications. FFT. Jacobians and transformation of multiple integrals.

MAT 330 **Methods of Optimization** 3-0-6
PA MAT 328

Nonlinear programming: Weierstrass theorem, local-global theorem. Lagrange multipliers method, Kuhn-Tucker theorem and its conditions, and algorithms based on the gradient method. Application to linear programming: existence theorem, duality theory, sensitivity analysis. Quadratic programming, convex programming, calculus of variations: Euler equations, conditions of Legendre, of Weierstrass and of Weierstrass-Erdman, problems with constraints. Application to elementary control theory, the bang-bang principle.

MAT 335 **Elements of Theory of Games** 3-0-6
PA 201-101, 201-105

Conflicts of interest and games. Zero-sum 2-person games. Mixed strategies. Minimax theorem. Solution of games by graphical methods, linear programming and successive approximations. Non-zero-sum n-persons games. Coalitions, negociation sets, statu quo points. Potential intimidation.

MAT 351 **Probability** 3-0-6
PA MAT 251

Probability distributions of functions of random variables: generating functions and convolution, change of variables. Markov

chains. The Poisson process: waiting times, arrival times and generalization of the process. Exponential models. Queuing theory: study of waiting lines (one and several servicing stations).

MAT 381 **Structured Programming** 3-0-6

Scalar and structured types. Control statements. Black structures, procedures, value and variable parameters, local and global variables, recursion. Pointers and dynamic allocation of memory. Top-down programming and program verification. Use of high-level and structured programming language such as PASCAL.

MAT 411 **Modern Algebra I** 3-0-6
PA MAT 212

Complex vector space and linear transformation, duality, hermitian, unitary transformations. Decomposition of a linear transformation. The Jordan canonical form. Affine and euclidean spaces. Tensor algebra.

MAT 412 **Modern Algebra II** 3-0-6
PA MAT 212

Theory of groups: cyclic groups, permutation groups, quotient group, direct product. Theory of rings: rings, ideals quotient ring, field. Group algebra, characters, representations.

MAT 413 **Introduction to Applied Algebra** 3-0-6

Algebraic structures: semi-groups, groups, rings, polynomial rings, fields, finite fields. Codes: encoding techniques, detection and correction of errors, linear codes, Hamming codes, polynomial codes, Base-Chaudhuri-Hocquenghem codes.

MAT 415 **Applied Modern Algebra** 3-0-6
PA 201-408

Algorithmic programming language, network analysis including PERT. Boolean algebra. Boolean functions and optimization problems. Error correcting codes.

MAT 421 **Methods of Applied Mathematics I** 3-0-6
PA MAT 328

Notions of functional analysis and integral equations. Approximated solutions of functional equations: intern and extern of a normed space, (stability, discrete convergence and convergence); approximations: partial, dual, auto-adjoint, discrete, of Galerkin, truncature of Tchebychev; approximations of operators: discrete,

weak, compact and differentiable. Applications: the radar and the sonar equations, methods of Ritz-Galerkin and of fractional steps, problems of Dirichlet and of Neumann.

MAT 422 **Method of Applied Mathematics II** 3-0-6
PA MAT 421

Elements of the theory of distributions. Fourier series and Fourier transforms revisited. Sine, cosine, and finite Fourier transforms. Laplace transforms. Green's functions revisited. Classification of partial differential equations of the second order. Hyperbolic equations, scattering. Differential equations and special functions over the complex domain, asymptotic expansions.

MAT 423 **Introduction to the Numerical Solution of Ordinary and Partial Differential Equations** 3-0-6

Finite differences. Iterative solution. Variational principles; the Ritz method. Finite elements.

MAT 461 **Numerical Analysis** 3-0-6
PA MAT 212; MAT 222; 201-408

Systems of numbers and errors. Finite differences, Lagrange and Hermite interpolation. Evaluation of functions by series. Numerical differentiation and integration. Ordinary differential equations: Runge-Kutta methods, predictor-corrector methods. Simultaneous linear equations and matrices: matrix inversion, eigenvalues, solution of systems by numerical methods. Linear programming simplex method.

MAT 463 **Discrete Mathematical Structures** 3-0-6

Boolean Algebras; minimization; application to Logic Circuits. Graphs, trees, networks and their representation inside a computer. Shortest path, minimal tree, maximum flow, minimal cost flow.

MAT 471 **Operations Research** 3-0-6
PA MAT 212; 201-408

Linear programming. Effective methods in discrete dynamic programming. The transportation and assignment problems. Duality and post-optimality analysis. Stochastic linear programming. Integer and nonlinear programming.

MAT 475 **System Simulation** 3-0-6
PA 201-408; MAT 251 or ADM 242

System Models. System simulation. Probability concepts in simulation. Queuing systems. Discrete system simulation. Continuous system simulation. Introduction to a simulation language. Reliability of simulation results.

MAT 476 **War Games** 3-0-6

Combats mathematical models and analytical solutions. The Lancester equations: linear and quadratic laws. Classical conflicts and guerrillas. War games: research and officers training. Manual and computerized games. Simulation. Optimal use of the available equipment. Detection and tracking problems. Anti-submarine war.

MAT 493 **Computing Science Project** 0-5-5

For Fourth Year students of the Computing Science option, in the Mathematics orientation.

A computer related project, typically a programming effort in a particular area of Computing Science related to the Mathematics orientation. Two periods are reserved on the schedule at the first session for this project and three at the second session. A report and an oral presentation must be given at the end of the year.

Seminars

The Departments of the Division of Science offer their students a series of conferences, once a week. These conferences are given by qualified professors and researchers, each of whom will discuss his field of specialization as well as its present state and needs.

The various speakers are chosen among the professors of College militaire royal de Saint-Jean who are particularly active in research, and also from those of universities and scientific research institutions. This series of seminar is an essential complement to the regular courses. The program also includes visits to industries and laboratories, visits which are often of military interest as well.

Research

The research of the departments includes studies in both pure and applied mathematics in the areas of non-linear analysis, fixed-

points theory, optimization, finite elements combinatories, graph theory, probability and complex variables.

Tutorials

The department of mathematics is offering to students having difficulties, tutorials periods in each of the four mathematics courses of the collegiate level.

DEPARTMENT OF MILITARY LEADERSHIP AND MANAGEMENT

Head of the Department	Major C. Hamel, CD, BscSoc, Ma
Professor	Jacques Castonguay, BA, BTh, LPh, Lth, DPh
Associate Professor	Léandre Maillet, BA, MAPs, DPs
Lecturers	Captain J.-M. Harvey, CD, BSpGéogr, MBA
	Peter Toy, BA, MA
Part-time Lecturer	Captain D. Beaulieu, CD, BADm

350-101 **Introduction to Psychology I** 3-0-6

The principal objective of this course is to present the student an overview of the fields of psychology. The main themes covered include: research methods, development, sensation and perception, principles of learning, motivation, emotions and attitudes, intelligence, statistics and psychological tests, personality, specific behaviors: stress and performance, mental health and normality.

350-201 **Introduction to Psychology II** 3-0-6
PA 350-101

The principal objective of this course is the indepth continuation of the introduction to the psychological aspects of human behavior. Some of the main themes covered include: research methods employed in psychology, perspectives on human behavior, psychological development, complex learning and cognition, behavior modification techniques, behavior disorders, problem of society and environmental psychology.

MLM 221 **Social Psychology** 3-0-6
PA 350-101

The principal objective of this course is to introduce the students to the basic principles of social psychology and to enable them to analyze and interpret group phenomena, particularly as they apply to the military context. The main themes are: social communication and language, motivation, interpersonal influence, social perception and attribution processes, beliefs, attitudes and social values, group dynamics, leadership, sex differences in social behavior, interviewing and counselling.

MLM 232 **Psychology of Aggressive Behaviour** 3-0—6
PA MLM 221

The principle objective of this course is to study the complex phenomena of aggression in man and animals. Topics include: historical and

contemporary evidences of human aggression, definitions of aggression, psychological methods employed in the study of aggression, contemporary theories examining the sources of aggressive behavior, namely: the physiological bases of aggression, instinct theories of aggression, social-learning theory of aggression, analysis of important indices related to aggressive behavior; violence and society, legitimate aggression, methods of control in reducing aggression in contemporary society.

MLM 322 **Organizational Psychology** 3-0-6
PA MLM 221

The objectives of this course are twofold: to study the organization as a total system in order to understand employees' behaviour, to demonstrate how the organization's efficiency and effectiveness can be enhanced with knowledge of the interaction of small working groups and the organization. Topics covered include: historical perspectives of management, work and motivation, work group dynamics, morale and group processes, dynamics of conflict, leadership style and organizational design, and organization development.

MLM 341 **Management:** 3-0-6
PA MLM 221 **A Psychological Approach**

The course objective is to develop in the student an awareness of the theory and practice of management through the study and the discussion of the basic functions of management: planning, organizing, directing, and controlling. The second part of the course is devoted to an introduction to the personnel management function in large organizations. Topics covered include recruitment, selection, manpower planning, employee and management training and development, career patterns and peformance evaluation. Examples are drawn from personnel management practices in the Canadian Forces.

MLM 315 **Sociology of Warfare** 3-0-6
PA MLM 341

This course pursues three fundamental objectives: an introduction to sociological analysis, an elaboration of a conceptual framework on which to develop a sociological understanding of the origin, the evolvement and the consequences of social conflicts and wars in particular, and an acquisition of empirical knowledge relating to the principal dimensions of wars (incidence, intensity, duration, trends, cycles, stages and types). A focus is placed on the scientific study of war considered as a normal phenomenon from a sociological point of view, but which can be avoided (at least in principle). Attention is given to current military conflicts, despite difficulties in obtaining objective information, as compared to available information on past conflicts.

MLM 412 **Job Adjustment and Personality** 3-0-6
PA 350-101

The objectives of this course are to study some of the contemporary theories of personality as they relate to military situations. Emphasis will be placed on the human development and maturing of personality, personality conflicts within groups or between individuals, and the mechanisms of personality adaptation. This considers individual differences and situation analysis. Conduct of this course will be a combination of theoretical and practical approaches. It builds upon previously learned principles in the management of human resources.

MLM 422 **Behaviour in a Military Setting** 3-0-6
PA MLM 341 or
ADM 321

The objectives of this course are to go into greater depth in applying the theoretical concepts and theories studied throughout the MLM program and also to train participants to observe and analyse individual and group behaviours in a military setting. The emphasis is placed on communication, leadership and individual and group reactions to the exigencies of a military organization.

DEPARTMENT OF PHYSICS

Head of the Department	Alessandro S. Biffi, BA, BSc, MSc
Professors	Cheuk Yin Cheung, BSc, MSc, PhD
	Maurice Cormier, BA, BSc, MSc, DSc, N.D.C.
	Roger F. Favreau, Bsc, MSc, PhD
	Paul-Emile Girard, BES, BSc, MSc, DSc, N.D.C.
	Gisèle Goulard, LicSc, D 3e cycle, DSc
	Jules Marcoux, BA, BSc, MA,PhD
	Martin M. Perlman, BSc, MSc, PhD, F.APS, F.IPL
Adjunct Professor	Laurent-G. Caron, BScA, MScA, PhD
Associate Professors	Martin Boloten, BSc, MSc
	André Filion, BSc, MSc, PhD
	Fernand Ledoyen, BA, BSc, DSc
	Sesha Subramanian, BSc, MA, PhD
Assistant Professors	William E. Gravelle, BA, MA, PhD
	Bernard Mongeau, BScA, MScA, DScA, Ing.
	Capitaine Alain Rambo, BSc, MSc, PhD,
Lecturers	Capitaine Claude Laporte, BSc, MSc

203-101 **Mechanics** 3-2-4
PR 201-101, 201-103

For officer cadets of the Preparatory Year.

The objective of this course is to teach the fundamental laws of motion at the macroscopic scale and also the universal principles of conservation, and to introduce the student to the scientific methods.

Vectors. Vector kinetics. Vector dynamics. Inertial and non-inertial reference frames. Conservation principles. Mechanical energy. Conservative and non-conservative forces. Gravity. Optional: Planetary motion. Limits of Classical Mechanics.

Textbooks:

Resnick and Halliday, Physics Vol. I

203-201 **Electricity and Magnetism** 3-2-4
PR 201-101, 201-103;
CR201-203, 203-101

For officer cadets taking the Science and Engineering option.

The objective of this course is to study the fundamental laws of electricity and magnetism and the principle of operation of electromagnetic apparatus and instruments.

PHYSICS

Charge and matter. Electric field. Electric potential. Capacitance and dielectrics. Direct currents. Magnetic phenomena. Electromagnetic force. Measuring Instruments. Alternating current (introduction). Optional: Magnetic properties of matter. Alternating currents.

Textbooks:

Halliday and Resnick, Physics Vol. II
Boylestad, Introductory Circuit Analysis

203-301 **Waves and Modern Physics** 3-2-4
PA 203-101, 203-201

For officer cadets taking the Science and Engineering option.

The objective of this course is to study oscillating motion and its application in various physical phenomena.

Waves: Harmonic oscillations. Wave equation. Superposition principle for waves. Interference and diffraction. Stationary waves. Electromagnetic waves (physical optics and electric circuits). Quantum physics: Particle behaviour of waves. Wave behaviour of particles. Bohr atom. Nuclear structure. Electron diffraction. Uncertainty principle. Optional: Structure of nucleus. Reflection and refraction. Natural and artifical radioactivity. Nuclear energy.

Textbooks:

Halliday and Resnick, Physics, Vol I and II.

203-902 **Experimental Physics** 1-4-4
PR 203-201, 203-201;
CR 203-301

For officer cadets taking the Science and Engineering option.

The object of this course is to introduce the student to experimental techniques and methods, to the analysis of results and the writing of reports.

Lectures on experimental techniques, on the evaluation and calculation of uncertainties, the plotting and interepretation of graphs. Review of the basic elements of geometric optics. 18 experiments on a variety of subjects contained in the courses 203-101, 201 and 301.

Textbooks:

Experimental Physics, written by a group of professors.

203-927 **Physical Sciences** 3-0-3
PR 203-101

For officer cadets taking the Administrative Sciences and Humanities.

The object of this course is to complete the scientific education of students going into non-scientific studies by considering the fundamental aspects of science taken generally through the study of useful and practical applications both in chemistry and in physics.

In physics subjects selected from the following will be studied: electricity and magnetism; electronics; electromagnetic waves; modern physics, the history and evolution of physics; the influence of scientific discoveries on the evolution of society; the presentation of a paper on one of these subjects. (For complementary courses in Chemistry, see the Department of Chemistry under course 203-927).

Textbooks:

Casper and Noer, Revolution in Physics
Professor's Notes

PHY 211 **Mechanics** 3-1-5
PA 203-101; PR 201-408, 201-203; CR MAT 221

For officer cadets taking the Science options or the Engineering option.

Review of reference frames, vectors. Velocity and acceleration. Newton's laws. Circular motion. Motion of projectiles with and without air resistance. Collisions and conservation laws (in two dimensions). Conservation of angular momentum. Rotation of rigid bodies. Statics.

Textbooks:

Kleppner, Kolenkow, An Introduction to Mechanics

PHY 222 **Electromagnetism** 3-1-5
PA 203-201, 201-203;
PR MAT 221, 201-408;
CR MAT 222

For officer cadets taking the Science options or the Engineering option.

Review of electric and magnetic fields. Laws of Faraday and Lenz. Generators. Self-induction and mutual induction, stored energy. Electric fields in matter, dielectrics. Magnetic fields in matter, paramagnetism, diamagnetism and ferromagnetism. Alternating currents. Theorem of Thévenin and Norton. Introduction to Maxwell's equations and electromagnetic waves.

Textbooks:

Kip, Fundamentals of Electricity and Magnetism, 2nd Ed.
Edminister, Electric Circuits

PHYSICS

PHY 231 **Oscillations, Waves and Electric Circuits** 3-1-5
PR 203-301,
201-408, 201-203;
CR MAT 221

For officer cadets taking the Science options or the Engineering option.

Periodic motion analyzed using complex exponentials. Superposition of periodic motions. Free oscillations, damped oscillations, forced oscillations and resonance. LCR series and parallel circuits. The wave equation, standing and travelling waves, continuous vibrating systems. Wave trains, phase and group velocity.

Textbooks:

French, Vibrations and Waves
Boylestad, Introductory Circuit Analysis

PHY 262 **Modern Physics** 3-1-5
PA 203-301, 201-203;
PR 203-201,
MAT 221, 201-408;
CR MAT 222

For officer cadets taking the Science options or the Engineering option.

Special relativity: the Lorentz transformation, time dilation, length contraction, velocity addition, mass, momentum, energy. Introduction to quantum mechanics; potential wells, Schroëdinger's equation, the hydrogen atom, spin. Introduction to solid-state physics.

Textbooks:

Young Fundamentals of Waves, Optics and Modern Physics
Kittel, Mechanics

PHY 311 **Classical Mechanics I** 3-0-6
PA PHY 211, PHY 231,
MAT 222, CR MAT 321

For officer cadets taking the Honours course in Physics or a major in Physics. Elective for students taking the Computer Science course with concentration in Physics.

Motion of a particle in two and three dimensions, potential energy, stability, central forces. Motion in many particle systems, conservation laws. Accelerated reference systems, Coriolis force. Rotation of rigid bodies, Euler's equation, Euler's angle, the top. Introduction to Lagrangian formulation, applications.

Textbooks

Symon, Mechanics
Spiegel, Theoretical Mechanics

PHY 312 **Classical Mechanics II** 3-0-6
PA PHY 311,
CR MAT 322

For officer cadets taking the Honours course in Physics.

Matrices, curvilinear coordinates. Calculus of variations. Hamilton's principle, Lagrangian and Hamiltonian dynamics. Relativity. Coupled oscillators. Choice of topics.

Textbooks

Marion, Classical Dynamics of Particles and Systems
Fetter, Walecka, Theoretical Mechanics of Particles and Continua

PHY 314 **Intermediate Mechanics** 3-0-6
PA MAT 221, 203-101;
PR PHY 211, MAT 222,
MAT 321 ou MAT 326

For officer cadets taking one of the courses with a minor in Physics.

Review of Newtonian mechanics. Central forces. Accelerated reference frames, Coriolis force. Systems of particles, rigid bodies.

Textbook:

Fowles, Analytical Mechanics

PHY 316 **Mechanics of Continuous Media** 3-0-6
PA PHY 211;
PR 201-408;
CR MAT 223,
MAT 321 or MAT 326

For officer cadets taking the Honours course.

Fluid statics. Fluid dynamics: fluid motion and conservation laws. Dimensional analysis and dynamic similitude. Viscous flow: critical Reynold number, velocity distribution, friction coefficient, boundary layer, flow through simple pipe systems. Inviscid flow: velocity potential, stream function, flow about an immersed body, lift on air foils.

PHYSICS

Textbooks:

Streeter et Wylie, Fluid Mechanics
Haberman, Introduction to Fluid mechanics
Tritton, Physical Fluid Dynamics

PHY 321	**Electronics I**	2-0-4
PHY 322 PA PHY 222	**Electronics II**	2-0-4

For officer cadets taking the Honours course or a major in Physics.

Simple electronic components such as the diode, junction transistors, field effect transistors and their equivalent circuits are studied along with the principles of rectification, amplification, commutation and quantitative circuit analysis. Some linear integrated circuits such as operational amplifiers, timers and digital integrated circuits (logic circuits) such as gates and flip-flop combinations are also studied.

Textbooks:

Boylestad and Nashelsky, Electronic Devices and Circuit Theory
Millman and Halkias, Electronic Fundamental and Applications for Engineers and Scientists

PHY 323	**Experimental Electronics I**	2-2-5
PHY 324 PA PHY 222	**Experimental Electronics II**	2-2-5

For officer cadets taking one of the courses with a minor in Physics.

Simple electronic components such as the diode, junction transistors, field effect transistors and their equivalent circuits are studied along with the principles of rectification, amplication, commutation and quantitative circuit analysis. Some linear integrated circuits such s operational amplifiers, timers and digital integrated circuits (logic circuits) such as gates and flip-flop combinations are also studied.

Experimental study of electronic diagnostic tools, electronic components, linear and digital integrated circuits.

Textbooks:

Boylestad and Nashelsky, Electronic Devices and Circuit Theory

Millman and Halkias, Electronic Fundamentals and Applications for Engineers and Scientists
Professor's Notes

PHY 331 **Physical Optics** 3-0-6
PR 203-902, PHY 222,
PHY 231; CR MAT 223
ou MAT 326

For officer cadets taking the Honours course, a major in physics or one of the courses with a minor in Physics.

Geometrical optics, Maxwell's equations, electromagnetic waves, polarization, Fourier theory, Fresnel and Fraunhofer diffraction, Kirchkoff's integral, interference and gratings, coherence. Optional subjects if time permits.

Textbook:

Hecht & Zajac, Optics

PHY 334 **Signal Analysis** 3-1-5

For officer cadets in computer science, concentration in systems or physics.

Classification of signals; analogue-digital conversion; filtering and sampling. Fast Fourier Transforms; convulutions and correlations; analysis of various signals with a spectrum analyser. Survey of instrumentation used for digital filtering and FFT processors. Applications: Digital filtering, Radar, Sonar, vibrations.

Textbook:

Brigham, The Fast Fourier Transform

PHY 341 **Statistical Physics** 3-0-6
PR PHY 211, PHY 222, PHY 262, MAT 251, MAT 222

For officer cadets taking the Honours course or a major in Physics.

Principles of statistical mechanics. Quasistatic thermodynamics: equilibrium, entropy, Kelvin temperature scale. Statistical ensembles and the Boltzmann distribution. Spin systems, ideal gas and specific heat of solids. Maxwell velocity distribution.

Textbooks:

Reif, Statistical Physics, Berkeley Physics Course, Vol. 5
Reif, Statistical and Thermal Physics

PHYSICS

PHY 361 **Atomic and Nuclear Physics I** 3-0-6
PA PHY 231, MAT 251, PHY 262, MAT 223; CR MAT 322

For officer cadets taking the Honours course or a major in Physics.

Wave packets, Schrödinger equation, bound and free states, scattering, harmonic oscillator.

Textbooks:

Saxon, Elementary Quantum Mechanics
Modern Atomic Physics, Cagnac, P.B. Peyroula

PHY 362 **Atomic and Nuclear Physics II** 3-0-6
PA PHY 231, PHY 262, MAT 223; PR PHY 361,
MAT 251, MAT 321, MAT 322

For officer cadets taking the Honours course or a major in Physics.

The hydrogen atom, steady-state and time-dependent perturbation theory. Electron spin. Atomic sectra.

Textbooks:

Saxon, Elementary Quantum Mechanics
Modern Atomic Physics, Cagnac, P.B. Peyroula

PHY 381 **Electronics and Application I** 2-4-6

PHY 382 **Electronics and Application II** 2-4-6
PA PHY 222

For officer cadets in computer science, concentration in systems or physics.

Simple electronic components such as the diode, junction transistors, field effect transistors and their equivalent circuits are studied along with the principles of rectification, amplification, commutation and quantitative circuit analysis. Some linear integrated circuits such as operational amplifiers, timers and digital integrated circuits (logic circuits) such as gates and flip-flop combinations are also studied.

Experimental study of electronic diagnostic tools, electronic components, linear and digital integrated circuits.

Textbooks

Boylestad and Nashelsky, Electronic Devices and Circuit Theory
Millman and Halkias, Electronic Fundamental and Applications for Engineers and Scientists
Professor's Notes

PHY 391 **Experimental Physics** 0-3-3
PHY 392 0-3-3

PA PHY 222, PHY 231, PHY 262; CR PHY 321, PHY 322, PHY 361, PHY 331

For officer cadets taking the Honours course or a major in Physics.

Experimental methods and techniques in electronics, atomic physics and nuclear physics. Characteristics of tubes and transistors. Rectifiers, amplifiers, oscillators; circuit analysis, logic circuits. Franck-Hertz equipment, radioactivity, particle detection, vacuum systems, Rutherfords's experiment, neutron absorption, nuclear spectra. Physical optics.

Textbooks

Melissinos, Experiments in Modern Physics
Professor's Notes

PHY 399 **Weapon Technology** 3-0-3
PR 203-101

For officer cadets taking Military and Stratigic Studies.

The object of this course is to permit students taking the course in Military and Strategic Studies to learn the necessary technical knowledge required to evaluate the capacities and also the limits imposed upon tactical and strategic thought by the highly developed technology of modern armement.

Influence of physics on weapon development. Ballistics, Blasting effects. Missiles. Lasers. Military electronics. Nuclear armament: principle, destructive and radiation effects, bearing on strategy. (For complementary courses in Chemistry, see the Department of Chemistry under course CHM 399).

Textbook

Glasstone, The Effects of Nuclear Weapons

PHYSICS

PHY 421 **Electrodynamics** 3-0-6
PHY 422 3-0-6

PA PHY 311, PHY 331, MAT 223; PR PHY 421, pour PHY 422

For officer cadets taking the Honours course in Physics (421 and 422), and a major in Physics (421 only).

Electrostatics, Boundary value problems (rectangular, spherical and cylindrical coordinates) Green functions. Magnetostatics; Electromagntic induction, Maxwell's equations, Plane electromagnetic waves, waves in anisotropic media, charge, field interactions, wave guides and resonant cavities, other selected topics.

Textbooks:

Hauser, Introduction to the Principles of Electromagnetism
Jackson, Classical Electrodynamics
Bohr, Introduction to electromagnetic fields and waves

PHY 423 **Electromagnetic Waves** 3-0-6
PA PHY 222; PR PHY 311, PHY 331, MAT 223 ou MAT 326

For officer cadets taking a minor in Physics.

Orthogonal coordinates, line integral, Maxwell equations (integral form); grad, div, curl, Maxwell equations (differential form); dielectric and conducting media, boundary conditions; reflection and transmission; transmission lines, Smith chart, Poynting vector, waveguides, optional topics.

Textbooks:

Johnk, Engineering electromagnetic fields and Waves
Hayt, Engineering electromagnetics

PHY 426 **Logic circuit Design** 2-1-6
PR PHY 321, PHY 322

For officer cadets taking a major in Physics.

Description of logic families. Combinational logic design. Simplification of Boolean functions. Relay logic. Multivibrators, registers and counters. Number systems, digital codes, code conversion, digital arithmetic. Races. Microprocessor architecture, memory organization and addressing. Interface circuits.

Textbook:

Porat, Barna, Introduction to Digital Techniques
Professor's notes

PHY 427 **Microprocessor System Design** 2-1-6
PR PHY 426

For officer cadets taking a major in Physics.

Central processing Unit architecture. Addressing modes. Instruction set, Instruction timing, Status Flags. Stock operation. Interrupts. Parallel and Serial Input/output devices. Analog-to-Digital and Digital to analog conversion Techniques.

Textbook:

Peatman, Microcomputer-based Design
Professor's Notes

PHY 451 **Quantum Mechanics** 3-0-6
PA PHY 361, PHY 362; PR MAT 322

For officer cadets taking the Honours course in Physics.

Mathematical tools of quantum mechanics. Postulates of quantum mechanics. The harmonic oscillator: creation and annihilation operators. Addition of angular momenta. Diffusion. Applications.

Textbooks:

Cohen-Tannoudji, Diu, Laloë, Mécanique quantique, Vol. 1 and 2 Dirac, Quantum Mechanics

PHY 471 **Solid State Physics I** 3-0-6
PA PHY 222, PHY 262; PR PHY 361, PHY 341; CR PHY 362

For officer cadets taking the Honours course or a major in Physics.

Crystal structure. X-ray diffraction, Brillouin zones. Crystal binding. Lattice vibrations. Thermal properties of insulators.

Textbooks:

M. Ali Omar, Elementary Solid State Physics

PHY 472 **Solid State Physics II** 3-0-6
PA PHY 222, PHY 262; PR PHY 471, PHY 361, PHY 362

For officer cadets taking Honours in Physics.

Fermi electron gas. Electric, magnetic and thermal properties of solids. Band theory of metals, insulators and semiconductors; effective mass, holes. Impurity doping in semiconductors.

Textbooks:

M. Ali Omar, Elementary Solid State Physics

PHY 481 **Logic Circuit Design and Application** 3-3-6
PR PHY 381

For officer cadets in computer science.

Description of logic families. Combinational logic design. Simplification of Boolean functions. Relay logic. Multivibrators, registers and counters. Number systems, digital codes, code conversion, digital arithmetic. Races. Microprocessor architecture, memory, organization and addressing. Interface circuits.

Textbooks:

Porat, Barna, Introduction to Digital Techniques
Professor's notes

PHY 482 **Microprocessor System Design and Application** 3-3-6
PR PHY 481

For officer cadets in computer science, concentration in systems, physics or management.

Central Processing Unit architecture. Addressing modes. Instruction set, Instruction timing, Status Flags. Stock operation. Interrupts. Parallel and Serial Input/output devices. Analog-to-Digital and Digital-to-analog conversion techniques.

Textbooks:

Peatman, Microcomputer-based Design
Professor's notes

PHY 491 **Experimental Physics** 0-6-3
PHY 492 0-6-3
PA (PHY 321) & PHY 322) or (PHY 322 & PHY 324),
PHY 262; PR PHY 331

For Fourth Year officer cadets taking any science program.

Selected experiments in electromagnetism, atomic physics, nuclear physics and solid state physics, using modern techniques of computer processing and real time data acquisition. This course includes a

number of compulsory experiments as well as a research project for each student. This project will include a written thesis and an oral presentation at the end of the year.

Textbooks:

Melissinos, Experiments in Modern Physics
Professor's Notes

PHY 493 **Computer Science Project** 0-5-5

For Fourth Year students of the Computing Science option, in the Physics orientation.

A computer related project, typically a programming effort in a particular area of Computing Science related to the Physics orientation. Two periods are reserved on the schedule at the first session for this project and three at the second session. A report and an oral presentation must be given at the end of the year.

Seminars

The Departments of the Division of Science offer their students a series of conferences, once a week. These conferences are given by qualified professors and researchers both from CMR and from other institutions, each of whom will discuss his field of specialization as well as its present state and needs.

This series of seminars is an essential complement to the regular courses. The program also includes visits to industries and laboratories, visits which are often of military interest as well.

Tutorials

Professors may organise special lectures for weak students whenever they wish. Moreover special periods to this effect have been included in the timetable for the two years of collegiate studies.

Laboratory and Research

The experimental laboratory courses in Physics are designed to introduce the students to modern experimental techniques and teach them rigorous scientific methods. Some of these courses permit the officer cadets to particularly develop their initiative and ingenuity; furthermore, they complete the student's university training by making it more practical.

PHYSICS

The scientific research in the department is concentrated on the physics of semiconductors and dielectrics, the applications of lasers and holography, theoretical physics, the physics of explosives, the application of microprocessors as well as on several other subjects. Three research groups have been set up for this purpose: the Groupe de recherches en semi-conducteurs et diélectiques (GRSD), the Laboratoire-Laser du CMR (LLCMR) and the Laboratoire d'applications des microprocesseurs (LAM).

The GRSD consists of researchers from the Departments of Physics and Chemistry of CMR and Université de Sherbrooke who have a common interest in the fields of semiconductors and dielectrics. Through this group some students are able to take part of their post-graduate studies at CMR.

The LLCMR consists of civilian and military researchers interested in the applications of lasers and holography. Students sponsored by this group are able to pursue their post-graduate studies at Université Laval (LROL).

The LAM consists of civilian and military researchers from the departments of physics and computer sciences and engineering interested in data processing, speech recognition and synthesis.

In support of this work the department has a PDP 11/30 minicomputer and a Tektronic video console through which other computing centers may be reached. Furthermore there are terminals for CMR's Honeywell CP 6 in most laboratories.

DEPARTMENT OF SECOND LANGUAGES

Associate Professor and Head of the Department	Florent Tremblay, BA, BEd, MA, PhD., Ling.-Cons. (Off. lang. fr. du Qué.)
Professor	Francis X. Stever, BA, MA, PhD.
Assistant Pofessor	Michel Ladouceur, BPéd, L es L, MEd.
	Marian Olynyk, BA, MA, PhD.
Lecturer	Elisa Kekejian, BA, MA.
Part-Time Lecturer	Johanne Blais, B.A., M.A.
Senior Tutor	Clarence Paré, BA.
Language Tutors	Normand Arseneault, BA, BPéd.
	Suzanne Bodner, BA, TESL Cert., MEd.
	Randolph Fauteux, BA, BPE, TESL Cert.
	David Gravel, BA, L ès L.
	Linda Leinan, BSc, MEd.
	Richard Pelletier, BA, PBéd, Cert. TME (Credif).
	Gregory Reid, BA, MA, Dip.Com.,
	Judith Wolfe-Labbé, BA, MA.

ENGLISH AS A SECOND LANGUAGE

604-101-82	**Preparatory Year**	3-1-5
604-103-82		3-1-5

This course aims at developing a basic proficiency in speaking and understanding English. Within the framework of a practical vocabulary and proper pronunciation, emphasis is placed on mastery of the most frequent patterns of spoken English.

604-301-82		3-1-5
604-301-82	**Preparatory Year**	3-1-5

This course is designed for officer cadets with some ability to read and write English, yet who are in need of practice in oral expression. Through word study and controlled conversation, emphasis is placed on building vocabulary and refining pronunciation.

604-901-82	3-1-5
604-902-82	3-1-5

This course is designed for officer cadets already fairly fluent in English. While emphasis is placed on increasing fluency, considerable

time is devoted to the reading of selections from literature in English and to the study of grammar and composition. Students are given some knowledge of the history and development of the English language.

604-907-83	3-1-5
604-911-83	3-1-5

This course is offered to officer cadets whose knowledge of English is advanced. Learning situations are based on audio-visual programs: television, radio, newspapers, magazines. Students have to prepare reports on political, social, cultural and economic activities, to present them in a written form and to discuss them orally. Students are also introduced to literary genres: drama, novel and lyrics. They learn how to write critics and how to analyse the setting, the plot and the characters.

604-309-83	3-1-5
604-919-83	3-1-5

According to the needs of these students who are already bilingual, this course aims at further developing the four abilities: understanding and expressing oneself orally as well as in a written form. Then in agreement with the teacher, emphasis should be put on particular aspects of the language: literature or comparative grammar and stylistics or history of the language or literary critics.

604-102-82	**First Year**	3-1-5
604-104-82		3-1-5

This course is a continuation of English 604-101 and 604-103. In addition to continuing practice in speaking, special attention is given to the fundamentals of composition and to the reading of selected literary works.

604-301-82	3-1-5
604-302-82	3-1-5

This course is a continuation of English 604-301 and 604-302. Students are introduced to the literary usage of the language through a study of selected short stories, a novel and Canadian poetry. Special attention is given to developing writing skills through short essays and two term papers. Oral skills are developed through speeches, discussions, and the language laboratory.

604-901-82 3-1-5
604-902-83 3-1-5

This course is a continuation of 604-901 and 604-902. Less stress is placed on the development of conversation skill; more time is devoted to composition and to the study of modern British, American and Canadian literature.

604-907-83 3-1-5
604-911-83 3-1-5

This course is offered to officer cadets whose knowledge of English is advanced. Learning situations are based on audio-visual programs: television radio, newspapers, magazines. Students have to prepare reports on political, social, cultural and economic activities, to present them in a written form and to discuss them orally. Students are also introduced to literary genres: drama, novel and lyrics. They learn how to write critics and how to analyse the setting, the plot and the characters.

ESL 201 **Second Year** 2-1-6
ESL 211 2-1-6

This course is a continuation of 604-102 and 604-104. Officer cadets discuss selected short stories, plays and songs.

ESL 202 2-1-6
ESL 212 2-1-6

This course is a continuation of 604-301 and 604-302. Officer cadets discuss selected short stories, plays, modern poetry and songs. More time is devoted to effective writing.

ESL 203 2-1-6
ESL 213 2-1-6

This course is optional for all cadets of the second year who have attained the functional level in the Canadian Forces Language Test. This course involves intensive work in outline construction and development, clear and precise sentence and paragraph construction. The grammar and vocabulary of memoranda and evaluations are provided in this course.

SECOND LANGUAGES

ESL 302	**Third Year**	0-3-6
ESL 312		0-3-6

This course in English for all students who have not attained the level of functional bilingualism. The seminar will include both oral and written exercises.

ESL 303	0-3-6
ESL 313	0-3-6

Same contents as in ESL 203 and ESL 213.

ESL 402	**Fourth Year**	0-3-6
ESL 412		0-3-6

A continuation of ESL 302 and ESL 312.

ESL 403	0-3-6
ESL 413	0-3-6

A continuation of ESL 303 and ESL 313.

Please Note;

On his promotion, the officer cadet must have reached the minimal level of proficiency in English as a second language, called "functional", required by the Canadian Armed Forces.

FRANÇAIS LANGUE SECONDE

602-102-72 **L'année préparatoire** 3-1-5
602-302-72 3-1-5

Les objectifs de ce cours sont de faire prendre aux étudiants un premier contact avec la langue et de leur faire acquérir les outils de base leur permettant de communiquer dans des situations très simples en utilisant un vocabulaire limité. À ce niveau, l'accent est mis presque exclusivement sur l'expression orale.

602-113-72 3-1-5
601-303-77 3-1-5

L'objectif du cours est de développer la communication orale et écrite afin que les étudiants puissent s'exprimer convenablement selon les normes de connaissance correspondant à leur niveau. À l'expression orale s'ajoute un cours de compréhension auditive. Les étudiants sont appelés à rédiger de courts textes. Chaque étudiants doit lire tous les textes prescrits dans le programme de lecture; la compréhension est vérifiée par des contrôles réguliers.

602-313-72 3-1-5
602-323-77 3-1-5

Les objectifs du cours sont d'améliorer la compréhension auditive et l'expression orale par des exercices de laboratoire, des exercices structuraux, des discussions dirigées et l'analyse de textes extraits de journaux, de revues etc.; et d'améliorer la compréhension et l'expression écrites par des lectures dirigés de romans, des exercices de composition et des résumés de lecture.

602-433-77 3-1-5
602-901-72 3-1-5

Les objectifs du cours sont de permettre aux étudiants de passer des formes structurées de la langue à son libre emploi, d'acquérir de solides connaissances grammaticales et d'apprendre à s'exprimer oralement et par écrit, dans une langue aussi correcte que possible. En expression orale, l'étudiant fait des exposés et défend ses prises de position; en expression écrite, il rédige des rapports. Le programme de lecture inclut des articles de journaux et de revues que l'élève devra présenter et discuter.

SECOND LANGUAGES

602-911-77 3-1-5
602-934-77 3-1-5

Ce cours vice à éveiller la curiosité et à susciter l'intérêt des étudiants pour les deux principales cultures canadiennes et plus particulièrement la culture française: ses traditions, ses coutumes et ses réalisations dans les domaines artistique et littéraire. Sur le plan grammitical, on met l'accent sur la langue écrite.

602-202-72 **Première année** 3-1-5
602-402-72 3-1-5

Ce cours, tout comme celui de l'année préparatoire, vise à faire prendre aux étudiants un premier contact avec la langue et à leur faire acquérir les outils de base leur permettant de communiquer dans des situations très simples en utilisant un vocabulaire limité. A ce niveau, l'accent est mis presque exclusivement sur l'expression orale.

602-213-72 3-1-5
602-403-77 3-1-5

Ce cours a le même objectif que celui de l'année préparatoire, soit de développer la communication orale et écrite afin que les étudiants puissent s'exprimer convenablement selon les normes de connaissance correspondant à leur niveau. À l'expression orale s'ajoute un cours de compréhension auditive. Les étudiants sont appelés à rédiger de courts textes. Chaque étudiant doit lire tous les textes prescrits dans le programme de lecture.

602-413-72 3-1-5
602-423-77 3-1-5

Ce cours a les mêmes objectifs que celui de l'année préparatoire, c'est-à-dire d'améliorer la compréhension auditive et l'expression orale par des exercices de laboratoire, des exercices structuraux, des discussions dirigées, et l'analyse de textes extraits de journaux, de revues, etc.; et d'améliorer la compréhension et l'expression écrites par des lectures dirigées de romans, des exercices de composition et des résumés de lecture.

602-433-77 3-1-5
602-911-77 3-1-5

Ce cours a les mêmes objectifs que celui de l'année préparatoire, soit de permettre aux étudiants de passer des formes structurées de la langue à son libre emploi, d'acquérir de solides connaissances grammaticales et d'apprendre à s'exprimer, oralement

et par écrit, dans une langue aussi correcte que possible. En expression orale, l'étudiant fait des exposés et défend ses prises de position; en expression écrite, il rédige des rapports. Le programme de lecture inclut des articles de journaux et de revues que l'étudiant devra présenter et discuter.

FLS 201 **Deuxième année** 2-1-6
FLS 211 2-1-6

L'objectif du cours est de développer la communication orale et écrite afin que les étudiants puissent s'exprimer convenablement selon les normes de connaissance correspondant à leur niveau. À l'expression orale s'ajoute un cours de compréhension auditive. Les étudiants sont appelés à rédiger de courts textes. Chaque étudiant doit lire tous les textes prescrits dans le programme de lecture.

FLS 202 2-1-6
FLS 212 2-1-6

Les objectifs du cours sont d'améliorer la compréhension auditive et l'expression orale par des exercices de laboratoire, des exercices structuraux, des discussions dirigées, et l'analyse de textes extraits de journaux, de revues, etc.; et d'améliorer la compréhension et l'expression écrites par des lectures dirigées de romans, des exercices de composition et des résumés de lecture.

FLS 203 2-1-6
FLS 213 2-1-6

Facultatif pour les étudiants qui ont atteint le niveau fonctionnel, ce cours s'adresse aux étudiants qui ont une bonne connaissance du français parlé et qui désirent apprendre à écrire correctement, de façon claire et nuancée. Après avoir suivi ce cours, l'étudiant devrait savoir reconnaître les composantes d'une phrase simple et d'une phrase complexe; dégager les idées principales d'un texte; reconnaître dans un texte le temps, le mode et la voix du verbe et le rôle qu'ils jouent dans la transmission du message; écrire un paragraphe descriptif, un compte rendu, une lettre, une note des service.

FLS 302 **Troisième année** 2-1-6
FLS 312 2-1-6

Même programme que celui du cours FLS 202, FLS 212.

FLS 303 2-1-6
FLS 313 2-1-6

Même programme que FLS 203, FLS 213.

SECOND LANGUAGES

FLS 402	**Quatrième année**	2-1-6
FLS 412		2-1-6

Continuation du cours FLS 302, FLS 312.

FLS 403	2-1-6
FLS 413	2-1-6

Continuation du cours FLS 303, FLS 313.

Bien noter

A sa promotion, l'étudiant doit avoir atteint la cote minimale de bilinguisme exigée par les Forces armées canadiennes, soit le niveau dit "fonctionnel".

DEPARTMENT OF SOCIAL SCIENCES

Head of the Department	Captain Jean Gagnon, CD, BA, MA, MBA
Professors	Rosario Bilodeau, BA, LèsL, DèsL
	Roger Brière, BSc, LèsL, MA, PhD
Associate Professors	Georges Baillargeon, BA, MA, PhD
	André Dirlik, BA, MA, PhD
	David D. Ruddy, BSc, MA, PhD
Assistant Professor	François Gendron, BA, MA, D ès L
	H.P. Klepak, BA, MA,
	Paul Létourneau, BspH, MA, DEA, D 3e cycle
	Pierre Paquette, BA, MA, PhD
	Captain Gordon Vachon, CD, BA, MA
Lecturers	Philippe Constantineau, BPh, MPh
	Captain André Deschênes, BA
	Roger Léger, BA, BPh, LPh

320-901 **Economic Geography of Canada** 3-0-6

This course establishes the foundations of the economic, social and political life of Canada, in preparation for courses offered in the following years of the curriculum. It deals with the development of natural resources, the problems associated with such development and the regional disparities resulting.

330-901 **History of Western Civilization** 3-0-6

The main objective of this course is to understand the ideas which have nurtured the rise of Western Civilization; to investigate the reactions of the rest of the world towards the West; to understand how a small and relatively unimportant section of the world could have so disproportionate an influence on the world; and to study the withdrawal of the West following the Second World War.

330-924 **Social and Economic History of Canada since 1850** 3-0-6

The objective of this course is to familiarize the students with the main phenomena of Canadian history through the study of the birth and evolution of federalism; economic nationalism and continentalism, from the railroad era to the oil and gas-pipelines era; colonialism and neocolonialism, that is from the British Empire to the American Empire; industrialization and urbanization, the evolution of political parties, of legislation and of idealogies; Canada on the international scene.

SOCIAL SCIENCES

330-983 **Decolonization and Problems of the Third World** 3-0-6

The purpose of this course is to make the students aware of the problems, the aspirations and the options for development of the Third World.

340-225 **Political and Social Philosophy** 3-0-6

The purpose of this course is to introduce the students to the study and discussion of Western political and social theory which has, from Plato onward, focussed on such questions as: the nature and purpose of the state; the best practicable constitution; the dialectic implied by the notions of common good, self-interest and individual freedoms; the social problem; and the relationship between states.

383-920 **Introduction to Economics I** 3-0-6

This course is concerned with the behaviour of the economy as a whole. Particularly, it deals with the overall functioning of capitalist type economies. It is concerned with the determination of the economy's total output, the price level, the level of employment, interest rates, the balance of payments, and exchange rates. The course has three main objectives: providing the students with a good understanding of the functioning of an economy, an awareness of the main issues currently debated both nationally and internationally, and enabling the students to evaluate and judge contemporary economic events, phenomena and policies. These objectives will be pursued using both a theoretical and a descriptive approach.

383-921 **Introduction to Economics II** 3-0-6

The purpose of this course is to introduce various basic concepts and analytical tools relevant to Microeconomics. Topics studied will be: the theory of Consumer Behaviour, the theory of the Firm, the product and factor markets, and the analysis of production costs. Perfect and imperfect competition will be studied; however, emphasis will be on the perfect competitive environment.

SCH 212 **Microeconomics Analysis** 3-0-6
PA 383-921; ADM 241

The purpose of this course is to analyse the functioning of markets, and the economic behaviour of consumers and producers. This course is designed especially for administrators, and its content is slightly different from traditional microeconomic courses. As a secondary objective, this course aims at familiarizing students with the systematic analysis of problems.

SCH 216 **Classical Strategy** 3-0-6

This course deals with the development of classical strategic thought from ancient times down to the arrival of the atomic bomb. The great thinkers involved in this development will be studied and will include Thucydides, Sun-Tzu, Jomini, Clausewitz, Marx, Mahan, Liddell-Hart, and Douhet.

SCH 221 **Political Science** 3-0-6

The study of the nature of man in society is the primary objective of this course. This is done through a study of the fundamental nature of man and the purpose of the state, through a study of political science itself and through a comparison of four different political systems.

SCH 222 **Canadian Political Institutions** 3-0-6
CR SCH 221

The objectives of this course are to impart an understanding of the parliamentary system of government, and to understand the procedures by which the people of Canada can achieve their aims through the give and take of parliamentary compromise.

SCH 232 **Military History of Canada I** 3-0-6

A critical study of the major stages of Canada's military history. It stresses our role in the various wars in which we took part.

SCH 254 **Canadian Society** 2-1-6

Canadian Society is today formed of founding peoples of native peoples and of neo-canadians. This society is presently in the making as a result of bilingual and multicultural policies. Students shall acquaint themselves in this course with the major contemporary social theories. They shall then look into the content of Canadian Society.

SCH 311 **Economic History in a Social Context** 3-0-6

This course is designed to give an overview of economic thought (theory and doctrine) and economic events. Different economic developments are discussed chronologically with respect to their contribution to the present day. The student is thus exposed to the main socioeconomic problems of the modern world, particularly the problems of industrialized versus developing nations.

SCH 312 **Canadian Economic History** 3-0-6
PR SCH 311

The overall objective of the course is to give students a good understanding of Canadian economic history. The course identifies and examines the evolution of those institutions which played important roles in Canadian economic development, and analyses the historical roots of social, political and economic problems. The course adopts the perspective that the economic and historical development of Canada should best be examined in an international context. It thus begins in Europe on the eve of the "discoveries" and gradually proceeds to the post World War II period. The interactions between the Canadian economy and those of other nations on which it was made dependant will thus be closely surveyed.

SCH 313 **Macroeconomic Analysis** 3-0-6
PA 383-920; 383-921

The main objective of the course is that of improving the students understanding of the overall functioning of contemporary economies and of the complexity of the difficulties which they continuously face. The first part of the course will consist of an in-depth survey of macroeconomic theory; the Keynesian approach will be emphasized. The second part of the course will examine important contemporary issues: prices and incomes policies, inflation, unemployment, stagflation, monetarism, the economic role of the State.

SCH 317 **Defence Economics** 3-0-6

This course applies economic concepts and methods to decision-making problems in the realm of national defence. In this light, the student will examine how economic considerations have influenced certain aspects of defence policy in the past.

SH 318 **The Soviet Union and its Defence Policy** 3-0-6

The purpose of this course is to provide the students with a basic understanding of the USSR, its army, society, economy, political system and major aspects of its foreign policy. It focusses attention on the realities of Soviet defence policy in our era.

SCH 319 **Great Battles** 3-0-6

A study of a number of great battles to highlight how strategic and tactical principles were applied in various circumstances over the course of history.

SCH 323 **Contemporary Military Figures** 3-0-6

The purpose of this course is to introduce to the students several military figures in the context of the strategic and technological conditions in which they worked.

SCH 326 **Nuclear Strategy** 3-0-6

This course studies the principles of contemporary nuclear strategy and of the problems related to it. It includes an analysis of the theoretical concepts of deterrence, détente, escalation and crisis management. It also examines the major strategic doctrines: massive retaliation, graduated deterrence, and mutual assured destruction.

SCH 360 **Concepts and Methods in International Relations** 3-0-6

This course aims to teach students the basic concepts as well as the main methods used in the analysis of international relations. Fundamental aspects of the contemporary international system will also be discussed.

SCH 412 **Managerial Economics** 3-0-6
PA SCH 212

The aim of this course is to familiarize the student with the application of economic principles and methodologies to the decision-making process of the firm. It emphasizes the use of the tools and techniques of economic analysis to analyse and solve managerial problems.

SCH 415 **Canadian Defence Policy** 3-0-6

This course should allow the student to understand the context of Canadian defence policy since 1945. We will review the problems resulting from the safeguarding of our national sovereignty, our participation in North American defence, the carrying out of our commitments towards NATO and our role in peacekeeping operations throughout the world.

SCH 417 **Strategic Resources** 3-0-6

This course will examine the role and the importance of certain strategic resources as regards national security policy. Consideration will be given to the geographic, political and economic dimensions of each case study.

SCH 419 **Current Strategic Problems** 3-0-6

The purpose of this course is to develop the conceptual and analytical abilities of the student in regard to current strategic and military problems either in relation to the evolution of East-West relations or to the North-South opposition. The problems selected for analysis could change each year depending on the evolution of international problems.

SCH 421 **International Relations II** 3-0-6

The purpose of this course is to familiarize the students with the current schools of thought in this field. It focusses attention on international conflicts and their peaceful settlement.

SCH 424 **The Canadian Identity** 3-0-6

This course invites the students to consider what constitutes the basis of a national identity. We draw attention particularly to the efforts of the Canadian government to maintain its political autonomy separate from that of the United States and to the expression of a national will in the country's economy and communications. The following topics are given special attention: the presence of foreign multinational companies and its economic and social consequences in the host country, the influence these companies exert on the national government; the Canadian bourgeoisie and its national consciousness: American imperialism and the Canadian intellectuals; regional concern and the sense of identity; Canadian labor unions and international unions.

SCH 426 **Comparative Defence Policy** 3-0-6

In this course, a comparative analysis is made of the national defence policies of the United Kingdom, France, China, and Sweden from the point of view of each country's geopolitical situation. Analysis deals with organization, personnel, doctrinal and weapons concerns.

SCH 428 **U.S.A. and its Defence Policy** 3-0-6

This course should allow the student to understand the dynamics of the relation between the political factor and the military factor in America, to analyse the strategic doctrines since 1914 and the general organization of American defence as well as the distribution of American force in the world.

SCH 440 **Arms Control and Disarmament** 3-0-6

This course will examine the issues that have motivated arms control and disarmament negotiations since the late-nineteenth century; and it will consider the role that such negotiations and, in certain cases, agreements are said to play as elements of national security policy.

SCH 450 **Third World** 3-0-6

The course attempts to add depth to the student's knowledge of current problems in the Third World particularly in the realm of national security. Two case studies are chosen for elaboration each year.

SCH 452 **Canadian Civilization** 3-0-6

It is through the study of all aspects of the daily experience of Canadians that one can really understand the make-up of the Canadian cultural identity. This is the sole object of the courses of history, sociology, literature, geography, economics and political science. This course will try to deal with areas not already covered by the aforementioned courses and will attempt to integrate and synthesize what has already been dealt with. Particular emphasis will be placed on the arts such as architecture, painting, sculpture, music, cinema and theater. This course will include meetings with Canadian artists as well as visits to various museums and other places allowing direct contacts with social values, standards and beliefs which have been the object of discussion during formal courses. The student will also study the folklore, legends and traditions of various ethnic groups.

DRILL

Instructors

Chief Warrant Officer J.E.C. Gagnon, MMM, CD.
Master Warrant Officer J.J.M. Dessureault, CD
Sergeant J.L.M. Jacques, CD
Sergeant J.A.M. Rioux

Aim

The object of Drill is to teach the students to obey instructions instinctively and properly, stimulate the power to command through mutual instruction, and develop leadership qualities through responsible handling of groups of officer cadets.

Contents

Drill includes Rifle, Sword and Foot Drill Elementary, Advanced, and Ceremonial, as prescribed by the Canadian Forces Drill Committee.

References:

CFP 201, Manual of Drill and Ceremonial

901-110	**Drill**	0-1-0
901-210		0-1-0

This course includes all movements in elementary drill.

901-311	**Drill**	0-1-0
901-411		0-1-0

Flight and Squadron Drill, including:

a. voice culture,

b. words of command,

c. inspections, and

d. mutual instruction.

DRILL

XML 200	**Drill**	0-1-0
XML 210		0-1-4

This course is a continuation of Drill 901-110, 901-210, 901-311, and 901-411, plus instructions in Wing Drill.

XML 300	**Drill**	0-1-0
XML 310		0-1-0
XML 400	**Drill**	0-1-0
XML 410		0-1-0

PHYSICAL EDUCATION AND ATHLETICS

Director of Athletics	Major H.R. Helgason, BPE
Assistant Director	Captain J.A.J.M. Caron, BAdm (CMR).
Recreation Coordinator	Captain F.R. Folkmann, BPE
Chief Instructor	Warrant Officer M.L. Boudreau, CD.
Instructors	Sergeant M.A. Brazeau, CD
	Sergeant J.G.R. Claveau, CD
	Sergeant C.J.L.A. Decotret, CD
	Sergeant J.B.M. Dicaire, CD
	Sergeant R.R. O'Neil, CD
	Sergeant J.A.M. Smith, CD
	Master Corporal J.R.F. Gagnon, CD
	Master Corporal R.G. Gervais, CD
	Master Corporal J.G.C. Lagarde, CD

Physical Education and Athletic Facilities

CMR offers first class physical education and athletic facilities which include a 440 metre cinder-track, six soccer/football fields, two softball diamonds, eight asphalt tennis courts plus a marina which has both sailing craft and canoes. Indoor facilities include a double gymnasium, an ice-arena, 23 metre swimming pool, a sauna bath and a well-equipped weight-training facility.

The Physical Education and Athletic Program

The aim of the program is:

a. to instill an understanding of the theory and philosophy of physical education.

b. to develop physical fitness, sport skills and habits necessary for maintaining physical fitness.

c. to develop leadership qualities and other attributes of an officer.

The aim of the program is achieved through a balanced and progressive schedule of activities composed of the following:

a. Physical Education classes (theory and practical);

b. Intramural Athletics.

c. Intercollegiate Athletics.

These three components are complementary and are considered an integral and indispensable part of the whole program.

PHYSICAL EDUCATION

PHYSICAL EDUCATION PROGRAM

The aim of the physical education program is achieved by means of compulsory participation by all officer cadets in 90 minutes of physical education classes each week, which are conducted during the normal academic day.

109-101 **Preparatory Year Program — First Term** 0-2-0

Meeting the requirements of the Canadian Forces Military Survival Swim Standard. The development of personal health habits and care in sport and fitness activities. The development of individual sport skills through participation in a variety of selected seasonal sports. Compulsory participation in vigorous physical fitness activities. Participation as minor officials in various leagues and tournaments.

109-201 **Preparatory Year Physical Education Program — Second Term** 0-2-0

An introduction to modern physical fitness training techniques coupled with rigorous participation in a variety of physical fitness activities. A study of health hazards as related to physical fitness and personal well-being. Further development of individual skills and regular participation in selected seasonal sports activities. Participation as minor officials in various leagues and tournaments.

109-301 **First Year Physical Education Program — First Term** 0-2-0

Further development of soccer and aquatic skills/knowledge. Comprehensive development of individual sports skills plus an introduction to team strategies in selected seasonal sports. Regular participation in sports competitions as both player and minor official. Compulsory participation in demanding physical fitness activities.

109-401 **First Year Physical Education Program — Second Term** 0-2-0

Development of knowledge and appreciation of modern physical fitness training techniques including vigorous participation in physical fitness related activities. An introduction to the techniques of organizing Canadian Forces sports events. Practical application of these techniques are included. Development of individual skills and

team strategies in selected seasonal sports including regular participation as a player and official.

EPH-200 **Second Year Physical Education Program — First Term** 0-2-0

Continued emphasis on physical training activities. An introduction to the techniques of organizing leagues and tournaments. Practical application of these techniques are included. An introduction to the fundamentals of wrestling, broomball and aquatics.

EPH-210 **Second Year Physical Education Program — Second Term** 0-2-0

Students will select one of the following activities: swimming, volleyball, basketball, hockey, or badminton for indepth study. Opportunity exists for the development of advanced individual skills and team strategies. Students will be introduced to the fundamentals of coaching as well as exposure to the administrative and officiating aspects as they concern the selected activity. University athletes are encouraged to select a sport other than their specialty.

EPH-300 **Third Year Physical Education Program — First Term** 0-2-0

Third year students continue to participate in vigorous physical fitness programs. Discussion of modern training techniques is continued. Students are exposed to a series of classes on unarmed combat and softball.

EPH-310 **Third Year Physical Education Program — Second Term** 0-2-0

During this term officer cadets again select one of the following activities for indepth study: aquatics, volleyball, basketball, hockey, broomball, badminton.

EPH-400 **Fourth Year Physical Education Program — First Term** 0-2-0

The theoretical aspect of the course includes discussion of sports and physical education in the Canadian Forces, the duties of a unit sports officer and planning a personal physical fitness maintenance program. Activities during this term will include golf, tennis, and canoeing-camping.

PHYSICAL EDUCATION

EPH-410 **Fourth Year Physical Education Program — Second Term** 0-2-0

Officer cadets will look at designing physical fitness programs and activity periods for groups of personnel up to platoon level. An update of theoretical fitness and conditioning information shall be conducted as mini-lectures throughout the term. Students will complete their indepth study of a sport by selecting one of the following: country ski, curling, bowling, and racquetball.

INTRAMURAL ATHLETIC PROGRAM

The intramural athletic program contributes to the attainment of the objective as an extension of the physical education program by:

a. Providing an opportunity for the development of individual sport skills and applying the principles which were presented in the physical education program.

b. Providing further opportunity to develop physical fitness.

c. Providing a competitive environment in which the qualities of leadership, competitiveness, agressiveness, self-discipline, self-sacrifice and esprit-de-corps are required to a greater degree than in the instructional environment of the physical education program.

d. Providing the opportunity for the development of poise and the ability to make decisions through experiences of organizing, officiating and coaching in the various intramural programs.

The intramural athletic program is divided into two areas:

a. Intersquadron league play which is compulsory for all officer cadets not participating on university athletic teams.

b. Wing Championships and tournaments which include individual and team events. These activities are voluntary and open to the entire cadet wing.

Responsibility for the day to day operation of the intramural athletic program rests with the officer cadets, under the supervision of Athletic Department personnel. Because of this operational approach, officer cadets are presented with the opportunity to develop leadership qualities through participation as activity convenors, officials, managers and coaches as well as players.

In conjunction with the intramural athletic program, specialty clinics for officials and coaches of team sports are offered to those officer cadets who are interested and assigned duties in these areas. As is applicable, appropriate provincial certification is awarded to successful candidates of the clinics.

The core activities of the intramural program include: soccer, football, softball, hockey, volleyball, basketball, team handball, cross-country running, track and field, badminton, broomball, water-polo, triathlon and swimming.

THE INTERCOLLEGIATE ATHLETIC PROGRAM

The intercollegiate athletic program is designed for officer cadets of superior athletic skill and playing ability and contributes to the achievement of the aim by:

a. Providing the opportunity for the individual to participate in highly skilled, competitive, organized athletics.

b. Providing the opportunity to achieve a high level of physical fitness.

c. Instilling through the demands of training and competition the desire to excel, developing self-discipline and encouraging self-sacrifice for a coordinated team effort.

d. Creating through the efforts of the College teams a college esprit-de-corps.

CMR is a member of the Fédération des associations sportives collégiales du Québec (FASCQ) a 52 member association of provincial CEGEPs. The FASCQ is a member of the Canadian Colleges Athletic Association (CCAA). CMR currently competes in nine university sports: basketball, volleyball, cross-crountry running, European handball, football, hockey, curling, judo and soccer. In addition to regular participation in the FASCQ, CMR's university team participate in exhibition contests both interprovincially and internationally. An example is the annual hockey series against the United States Military Academy.

Recent successes of CMR athletic teams include; three undefeated football seasons which culminated in three FASCQ "A" Bol d'Or Championships — 1976, 1977 and 1983, A Quebec University Athletic Association Championship in Cross-Country Running in 1976 plus a FASCQ team championships in 1978 and 1979. Further, individual officer cadets have honoured CMR by winning many invitational and provincial awards in Judo.

Physical Education Assessment of Students

Each officer cadet is assessed in five areas covered by the Physical Education and Athletic Program:

a. Physical fitness as detailed by the Canadian Military Colleges Physical Performance Tests;

b. Swimming requirements as outlined in Canadian Forces Administrative Orders;

c. Theoretical knowledge as dictated by the physical education curriculum;

d. Sport skill evaluation insofar as participation in the Physical Education program is concerned; and

e. Instructor assessment of desired officer-like qualities as related to the Physical Education and Athletic Programs.

The students who do not attain or maintain the required physical fitness or aquatics standard are obliged to participate in a compulsory remedial program until they can meet the standard.

RECREATION PROGRAM

CMR offers a comprehensive program of recreational and leisure time pursuits which is conducted as part of the Officer Cadet Mess activities under the general supervision of the CMR Recreation Association. Participation in the recreation program is compulsory and a period of time is specifically guarded each week for its operation. The program is so diverse, however, that certain clubs find it necessary to operate outside of the formal arts and hobbies period, in order to meet their specific needs.

The recreation program includes:

a. military oriented activities such as: fencing, flying, parachuting, combat arms, sailing and shooting clubs;

b. sports oriented activities such as: archery, badminton, curling, gymnastics, alpine/nordic skiing and tennis;

c. art and hobby clubs such as: aero-modelling, art, astronomy, automobile, ceramics, dance, debating, investment, media, Christian Fellowship, music, photography, publicity, radio electronics and sound and light.

ACADEMIC REGULATIONS*

Definitions

Program of study: A group of courses completing a year's program of studies.

Subject: A division of the program of studies.

Course: A series of lectures and/or laboratory periods, designated by a number in the curriculum, required for annual assessment.

Elective course: Within his program of studies, a course that a student must select from an offered group. Such elective courses carry appropriate credit and marks obtained are included in the student's grade average.

Optional course: In his program of studies, a course that a student may select and follow. This course is valid for credits but is not included in the student average.

Extra course: A course that a student may take, though it is not in his program of studies. Such a course carries the appropriate credits but marks obtained are not included in the student's grade average.

Failed-Credit Standing: Standing granted on the recommendation of the Faculty Board, and with the approval of Faculty Council and the Commandant, in a failed course for the purpose of allowing a student who fails one course to pass the year. The mark will be recorded with the annotation "Failed-Credit" (FC) and remains a failure for the purpose of determining whether or not work prerequisites to other courses has been completed.

Carry a Course: When it has been recommended by Faculty Council and approved by the Commandant, a student carries a course after failing this course in the previous term by taking the failed course again (or an authorized equivalent) in the first subsequent academic term in which the course is offered (schedule permitting) together with the normal academic workload of that term. The mark of the first attempt will be recorded on the transcript of marks for that term with the annotation against the failed course "Failed, but permitted to carry". That term will not be cleared until the carried course is passed.

* Specified academic regulations concerning the two other colleges may be found in their respective calendars.

Normally a student may not carry more than one course per term, nor can he carry a course in two consecutive terms. Without special permission of the CMC to which the student is transferring, a course may not be carried from one CMC to another.

Credit

a. A credit is a unit which allows le Collège militaire royal de Saint-Jean to assign a numerical value to the work load required of a student so that he may reach the goals of a teaching or research activity.

b. A credit represents 45 hours or periods per 15 week term devoted by the student in a learning activity (courses, research, laboratories, seminars, individual work).

c. For example, a credit corresponds to the following weekly load during a 15 week term:
one period of classroom teaching and
two hours of individual work;
or
one period of classroom teaching,
one period of practical work and
one hour of individual study; etc.

d. Let us take for example:

Course 202-201 **Chemical Solutions** 3-2-4

The three numbers on the right (3-2-4) represent the weighting of this course:
the first: the number of teaching periods per week;
the second: the number of periods of practical exercises per week;
the third: the number of hours devoted to individual work per week.
Hence $3+2+4=9$; $9\times15=135$; $135/45=3$. This course therefore carries three credits.

Duration of the Program of Studies

1. The duration of the program of studies is normally four or five academic years. The years are designated as follows: preparatory year, first year, second year, third year, and fourth year.

2. Entrance to the preparatory year requires completion of junior matriculation or its equivalent. Entrance to first year requires completion of a program equivalent to the preparatory year program of studies.

Degrees

3. Degrees are granted as follows:

a. On the recommendation of the College authorities, 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.

b. 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 the Royal Military College of Canada.

c. A degree of Bachelor of Arts or Science, as appropriate, shall be granted by the Royal Roads Military College of Canada to a student who has successfully completed his final year at the Royal Roads Military College of Canada.

Graduation Certificate

4. The College grants a graduation certificate of academic and military qualifications to the student who has received his bachelor's degree and his commission as an officer in the Canadian Forces. It also grants a certificate of collegial studies at the end of the First Year.

Program of Studies

Preparatory Year

5. All students registered in preparatory year are normally required to take all the courses prescribed.

First Year

6. All first year students are normally required to take the courses prescribed for the program of studies in which they are registered.

Second Year

7. All second year students are required to take the courses prescribed for the program of studies in which they are registered.

Third and Fourth Years

8. Programs for Third and Fourth Years are as follows:

a. Students who have successfully completed their second year in Administration, in Canadian Studies or in Military and Strategic Studies will normally complete their third and fourth years in this option at Le Collège militaire royal de Saint-Jean.

b. The remainder of the students may elect to complete their third and fourth years as follows:

(1) at CMR in Science or in another program of studies, under the conditions specified by CMR.

(2) at RMC in Arts, Science or Engineering, under the conditions specified by RMC,

(3) at RRMC in Military and Strategic Studies, Sciences or Oceanography, under the conditions specified by RRMC.

c. Details of the program of studies are laid in the current calendars of Le Collège militaire royal de Saint-Jean, Royal Military College of Canada, and Royal Roads Military College of Canada.

9. Students, who wish to complete their course program at the Faculty of Engineering of RMC, must meet the conditions listed under the section "Course Patterns" and subsection "Conditions for Admission into the third year courses of study at RMC".

10. Entry into Honours will normally be open only to those students who have obtained, at the end of the Second Year, a minimum combined average of sixty-six per cent (66%) in the Honours courses, an overall average of at least sixty per cent (60%), and have clearly passed the year at the first attempt without conditions. The departments and dean concerned may refuse a cadet permission to enter the Honours program.

11. A student in the Third of Fourth Years Honours programs must maintain a minimum combined average of sixty-six per cent (66%) in the Honours courses, a minimum average of sixty per cent (60%) in each of the Honours courses, and an overall average of at least sixty per cent (60%). Furthermore, he must pass each term at the first attempt without conditions.

12. The Faculty Council may, for cause stated, move a student from an Honours to a General course of study at any time before the completion of his fourth year, even though he may have obtained the standard required by these regulations at the annual examinations.

13. A student who has been advised not to take Arts or Engineering courses by his Canadian Military College on the completion of his second year, may be refused permission to register in these courses in his third year.

Drill and Physical Education

14. Courses in Drill and Physical Education must be taken by all students in all years.

Continuity of Studies

15. Extra courses — A student may take an extra course in each term in second, third, or fourth year with special permission of the Faculty Council.

16. Interruption of Studies — Under normal circumstances, a student may not postpone a year of study.

17. Change in the program of study:

a. A student may not alter his program of study without the permission of the Faculty Council.

b. Withdrawal from a Course:

(1) Elective course. An elective course which has been selected by a student at registration may be replaced by another course of the same category during the first month of the term in which the course is offered, if the department heads and the dean(s) concerned agree.

(2) Advance course. A student may only withdraw from an advance course forming an integral part of his programme of studies and which he has chosen at registration, only during the first four (4) weeks following the beginning of the term during which the course is offered.

(3) Extra course. A student may only withdraw from an extra course, which he has chosen at registration, during the first eight (8) weeks following the beginning of the term during which the course is offered. After the eight weeks period, any withdrawal, success or failure at a final examination as well as success or failure on supplemental examination will be reported on the report card.

(4) Optional course. A student may only withdraw from an optional course, which he has chosen at registration, during the first eight (8) weeks following the beginning of the term during which the course is offered. After the eight week period, any withdrawal, success or failure at a final examination as well as success or failure on supplemental examination will be reported on the report card.

18. Normally, a student may not transfer from one program of study to another, without having obtained the full prerequisite standing in the option he wishes to enter. The permission of the Faculty Council is required, except during the first two weeks of each term.

Attendance

19. Course attendance may be excused as follows:

a. With the consent of the Head of the Department, a student who is in third or fourth year may be excused from attending certain courses, provided that these exemptions are in the best interest of the student.

b. University level: a student who has reached the "integral" level of bilingualism is not required to take second language courses.

c. College level: a student who has reached the required level of bilingualism as determined by the Faculty Council of the College is not required to take second language courses.

Academic Standing

20. To be granted Pass Standing, a student must obtain at least grade "D" in each course as well as a general average corresponding to that grade.

21. An officer cadet must obtain a satisfactory standard in Physical Education and Drill, and a favourable report in officer-like qualities.

22. Graduation of Academic Standings

a.	First Class Honours	Grade A — 75-100 per cent
b.	Second Class Honours	Grade B — 66-74 per cent
c.	Third Class Honours	Grade C — 60-65 per cent
d.	Pass Standing	Grade D — 50-59 per cent
e.	Failure	Grade E — less than 50 per cent

For second language, students at the university level will be given credits in the form of a letter grade only.

23. Aegrotat Standing

Aegrotat standing may be granted by the Faculty Council to a student who has been unable to write one or more of the final examinations, but who has received satisfactory term marks in each course.

Final Examinations

24. Final examinations will be held at the end of each term.

25. A student may write his examinations in either English or French, except for the examination in Second Language.

26. The Faculty Board constitutes the examining board for all final examinations. Standing in final examinations is granted by the Faculty Board, subject to confirmation by the Faculty Council.

27. A student may be refused permission to write an examination:

a. in any course involving practical work in a laboratory, if his laboratory work has been unsatisfactory.

b. in any other course, if he fails to meet the requirements with regard to assignments.

Supplemental Examinations

28. A student who fails in not more than three final examinations in a term may be allowed to write supplemental examinations in the

courses concerned, provided that he has obtained an overall average corresponding to grade "D" or Pass standing except for his first term at CMR in any year.

29. Supplemental examinations will be written at the end of each term.

30. No second supplemental examinations will be allowed.

31. To obtain pass standing in a supplemental examination, a student must obtain at least grade "D", not including the previous term mark or examination mark.

32. Marks obtained in supplemental examination shall not be used to raise a student's academic average in any term.

Failure in a Term

33. An officer cadet fails his term:

a. If he fails to obtain a term overall average corresponding to Pass standing or grade "D" except when it is his first term at CMR in any year.

b. If he fails in more than three courses in a term.

c. if he fails one or more of his supplemental examinations and is not granted failed-credit standing or is not allowed to carry a failed course.

d. if he fails a course he has been allowed to carry.

Repeating a Term

34. A student:

a. may be permitted to repeat any term, but he may only repeat once in the four/or five-year program; and

b. may be authorized to repeat a term by NDHQ on the recommendation of the Faculty Council and the Commandant.

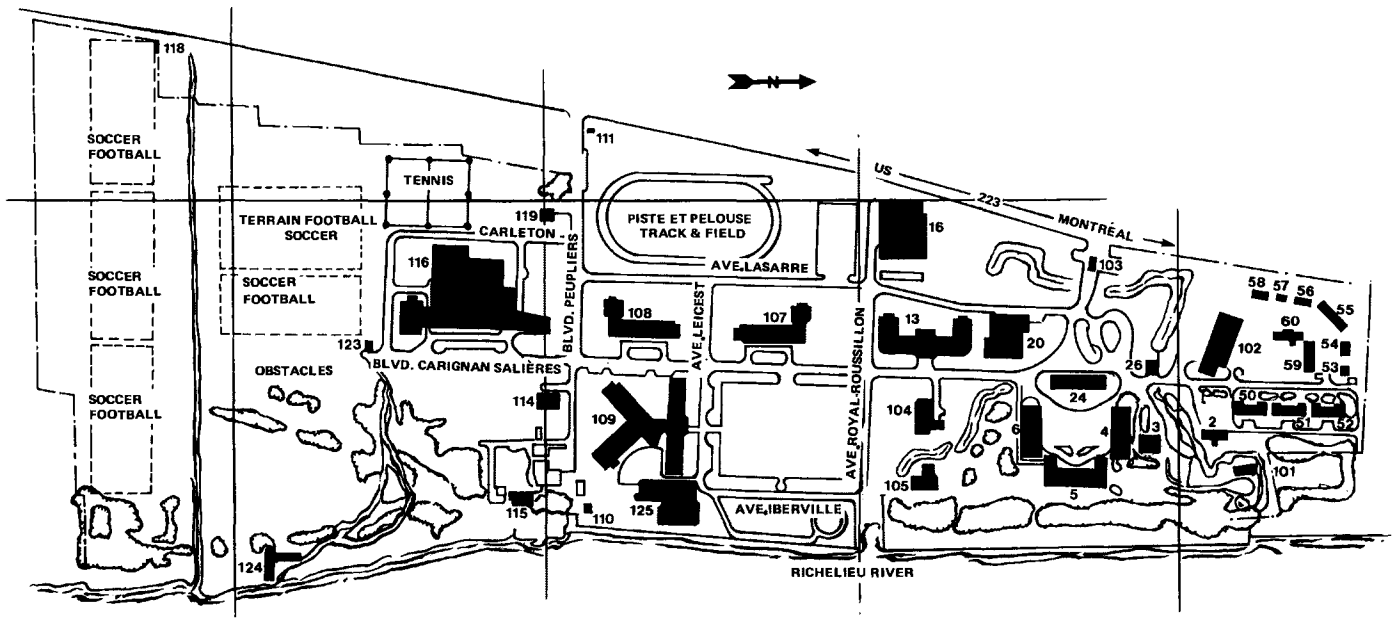
35. A student permitted to repeat a term must carry the equivalent workload of his full program of study.

Withdrawal

36. A student who fails in more than four courses in any term program of studies shall normally be required to withdraw.

37. A student who fails a term may be required to withdraw from the College, and a student who fails a term having previously failed a term, must withdraw.

38. A student who, in the opinion of the staff, fails to develop the necessary officer-like qualities will, on approval of the Commandant, be required to withdraw.



LEGEND

2. C.E. STORAGE
3. WO & SERGEANTS MESS
4. MONTCALM BLOCK
5. OFFICERS' MESS
6. LA GALISSONNIÈRE BLOCK
13. MAISONNEUVE BLOCK
15. STORAGE
16. DRILL HALL
20. DINING HALL
24. MASSEY BLOCK
26. MUSEUM
50. P.M.Q. 4-5-6-7
51. P.M.Q. 8-9-10-11
52. P.M.Q. 12-13-14-15
53. P.M.Q. 16
54. P.M.Q. 18-20
55. P.M.Q. 22-24-26-28
56. P.M.Q. 30-32
57. P.M.Q. 33
58. P.M.Q. 34-35
59. P.M.Q. 17-19-21-23
60. P.M.Q. 25-27-29-31
101. GREENHOUSE
102. SERVICE BUILDING
103. GATE HOUSE
104. R.C. CHAPEL
105. PROT CHAPEL
107. CHAMPLAIN BLOCK
108. CARTIER BLOCK
109. DE LERY PAVILION
110. STORM LIFT STATION
111. SAN. LIFT STATION
112. BATHING HOUSE
113. P.M.Q. 1
114. T.M.Q. 1
115. P.M.Q. 2
116. VANIER HALL
118. METEP PIT
119. P.M.Q. 3
122. NORTH FLUO. BLDG.
123. SOUTH FLUO. BLDG.
124. MARINA
125. LAHAIE PAVILION

Figure 1 Map of the Collège militaire royal de Saint-Jean

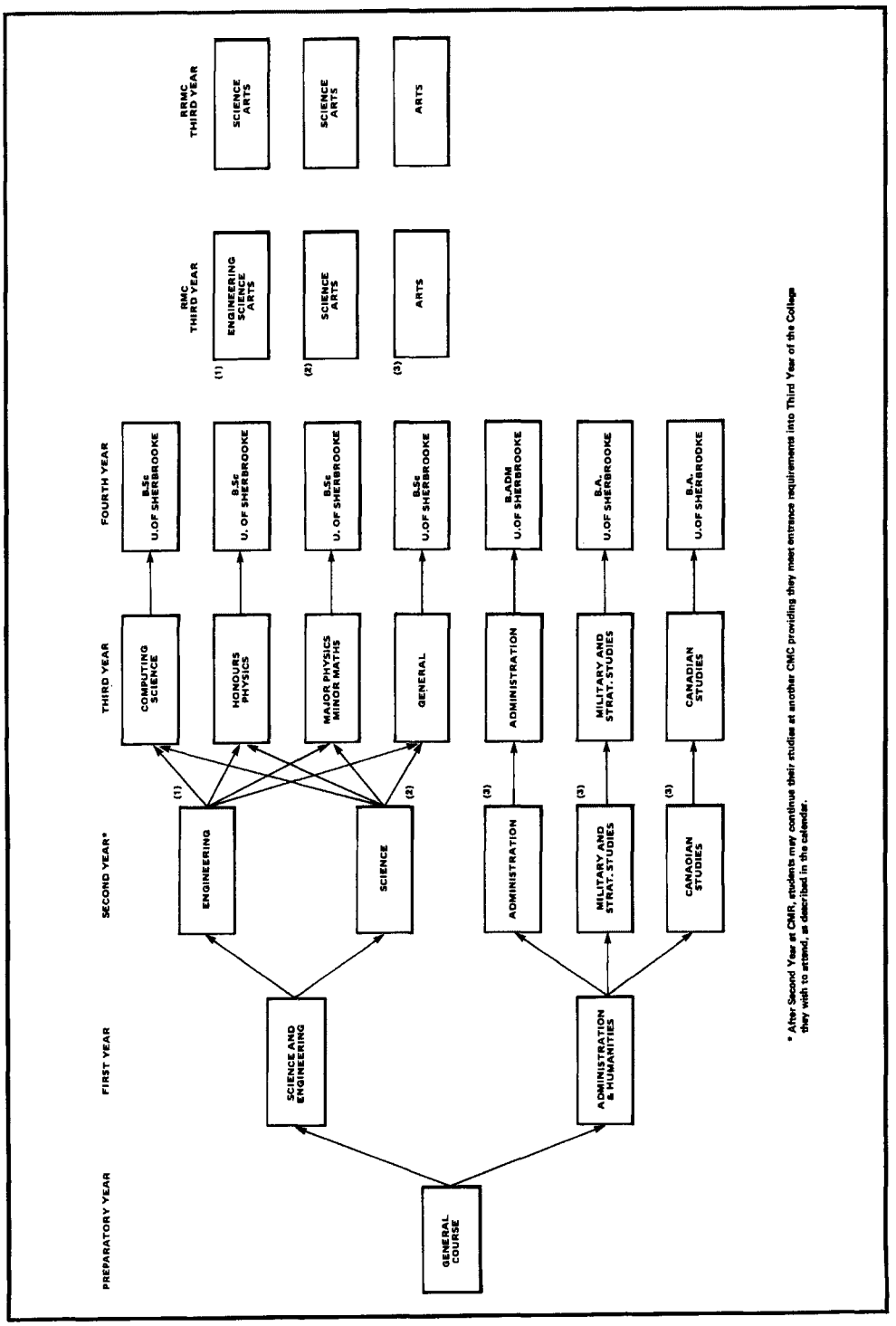
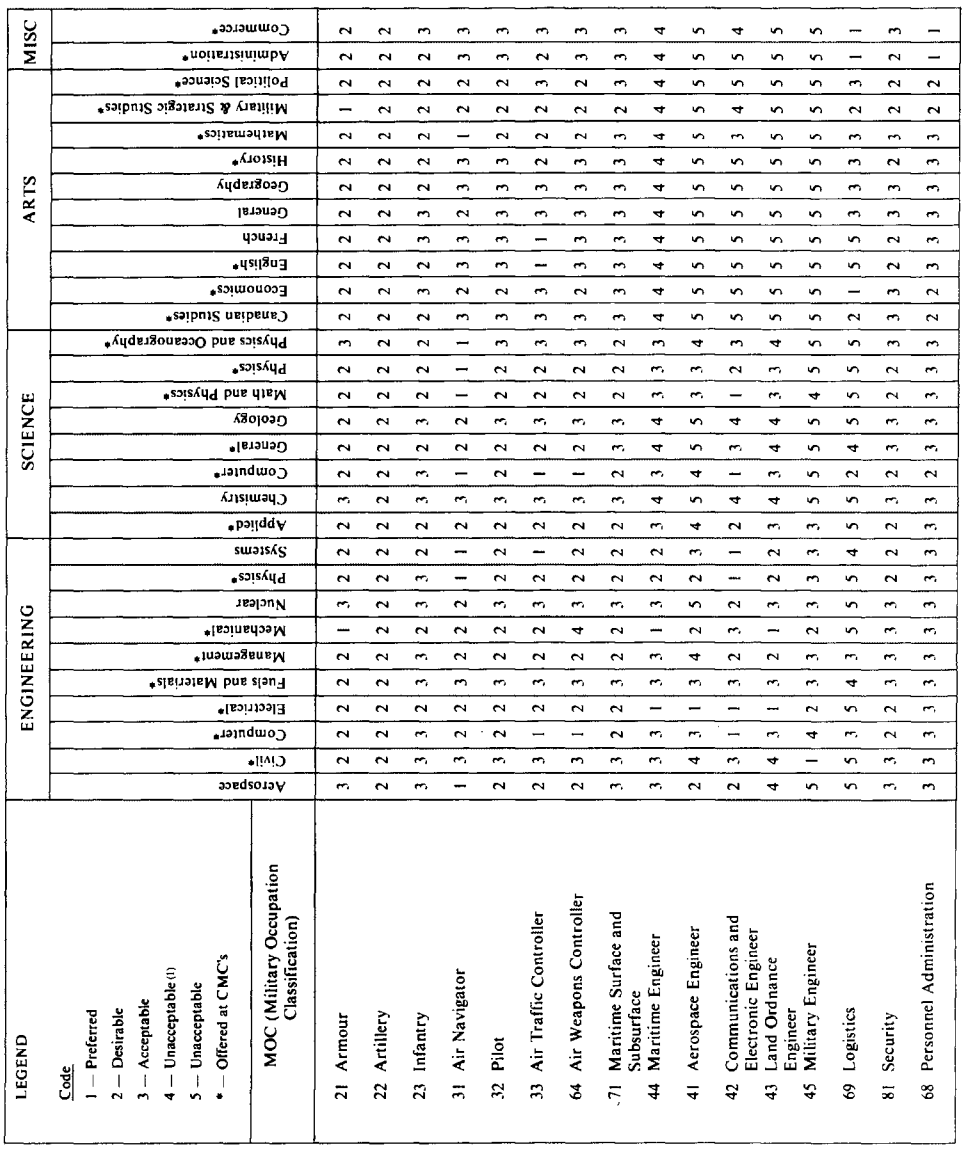


Figure 2 Program of studies at College militaire royal de Saint-Jean



LEGEND		ENGINEERING												SCIENCE								ARTS											MISC	
Code	MOC (Military Occupation 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*
1 — Preferred	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
2 — Desirable	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	2
3 — Acceptable	23 Infantry	3	3	3	2	3	3	2	3	2	2	2	3	3	2	3	2	2	2	3	3	3	2	3	3	3	3	2	2	3	3	3
4 — Unacceptable(1)	31 Air Navigator	1	3	2	2	3	2	2	2	1	1	2	3	1	2	2	1	1	1	3	2	3	3	2	3	3	1	2	2	3	3	3
5 — Unacceptable	32 Pilot	2	3	2	2	3	2	2	3	2	2	2	3	2	2	3	2	2	3	3	3	2	3	3	3	3	3	2	2	3	3	3
* — Offered at CMC's	33 Air Traffic Controller	2	3	1	2	3	2	2	3	2	1	2	3	1	2	3	2	2	3	3	3	3	1	1	3	2	3	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	3	2	2	3	3	3
	71 Maritime Surface and Subsurface	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	3
	44 Maritime Engineer	3	3	3	1	3	3	1	3	2	2	3	4	3	4	4	3	3	3	4	4	4	4	4	4	4	4	4	5	4	4	4
	41 Aerospace Engineer	2	4	3	1	3	4	2	5	2	3	4	5	4	5	5	3	3	4	5	5	5	5	5	5	5	5	5	5	5	5	5
	42 Communications and Electronic Engineer	2	3	1	1	3	2	3	2	1	1	2	4	1	3	4	1	2	3	5	5	5	5	5	5	5	3	4	5	5	5	4
	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	5
	45 Military Engineer	5	1	4	2	3	3	2	3	3	3	3	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	69 Logistics	5	5	3	5	4	3	5	5	5	4	5	5	2	4	5	5	5	5	2	1	5	5	5	3	3	3	3	3	1	1	
	81 Security	3	3	2	2	3	3	3	3	2	2	2	3	2	3	3	2	2	3	3	3	3	2	3	3	2	3	3	2	2	3	
	68 Personnel Administration	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	2	2	3	3	3	3	3	3	3	2	2	1	1

Figure 3 Classifications and Course Patterns for ROTP

(1) Code 4 indicates that the degree program by itself is unacceptable. However, if a candidate has previous work experience and/or training related to the specifications of the classification, the degree program may be acceptable.