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ROYAL MILITARY COLLEGE OF CANADA

UNDERGRADUATE CALENDAR 2006 - 2007

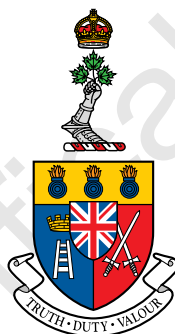
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2006 – 2007

Undergraduate

Calendar



Vérité, Devoir, Vaillance

Disclaimer

If there is a divergence between the information in this printed version of the Undergraduate Calendar or any of the departmental web pages within the RMC website and, that in the Undergraduate Calendar web pages, the information in the Undergraduate Calendar web pages will prevail, since it is recognized as the official Calendar.

Dates and Notices

Important Dates

FALL TERM - September 2006	
5 Sep	Classes start (years 2, 3, and 4)
11 Sep	Classes start (year 1)
29 Sep	Obstacle Course
30 Sep -1 Oct	Reunion Weekend
9 Oct	Thanksgiving (statutory holiday)
16 - 24 Oct	Mid-term Exams
04 Nov	Fall Convocation
13 Nov	Remembrance Day (no classes)
17 Nov	Fall Convocation
1 Dec	End of classes
4 - 15 Dec	Examinations
16 Dec	Christmas Holiday begins
WINTER TERM - January 2007	
8 Jan	Classes start
13 - 14 Jan	Supplemental examinations
19 - 23 Feb	Reading Week
26 Feb - 7 Mar	Mid-term exams
6 - 9 Apr	Easter Weekend (statutory holiday)
13 Apr	End of classes
16 - 27 Apr	Examinations
7 - 9 May	Supplemental exams IV yr
14 -15 May	Supplemental exams II, III yr
16 May	Convocation
17 May	Commissioning Parade

Notices

1. The course listings and academic programs described in this Calendar represent Senate-approved requirements and electives for completion of degree requirements. Circumstances beyond the control of the College, such as severe budget shortfalls, may result in restrictions in the number and range of course and program choices available to students as compared with those listed herein or in other College publications. The College reserves the right to limit access to courses or programs, and, at its discretion, to withdraw particular programs, options, or courses altogether. In such circumstances the College undertakes to the best of its ability to enable students registered in affected programs to complete their degree requirements in a satisfactory manner. Prospective students or new registrants are advised to consult the most current information available from the College and its various Faculties in printed or electronic form, as well as academic advisors for the programs concerned, before making registration decisions or course/program choices. The Senate and the Board of Governors of the Royal Military College of Canada reserve the right to invoke changes in this Calendar, in either its printed or electronic forms, at any time without prior notice.
2. Officer Cadets at the Royal Military College of Canada must select a course of studies which is compatible with their element of the Canadian Forces and with the Military Officer Occupation selected. The Canadian Forces reserve the right to limit enrolment in any given course of studies.

3. Both men and women may apply for admission to the Royal Military College of Canada.
4. Applications are processed through Canadian Forces Recruiting Centres (1-800-856-8488). Applications for admission should be submitted as early as possible in the final year of high school. Transcripts of final marks are not required to initiate an application.
5. If there is a divergence between the information in the printed version of the Undergraduate Calendar or any of the departmental web pages within the RMC website and, that in the Undergraduate Calendar web pages, the information in the [Undergraduate Calendar web pages](#) will prevail, since it is recognized as the official Calendar.
6. Additional information may be found on the Internet at: <http://www.forces.ca>

General Information

Role and Objectives

The Royal Military College of Canada

The Royal Military College of Canada (RMC) is a national university for educating and developing leaders committed to serving Canada. To achieve this goal, the demands of an RMC education go beyond academic achievement.

For Officer Cadets of the Regular Officer Training Plan, the Reserve Entry Training Plan or the University Training Plan - Non-Commissioned Members, the RMC degree consists of four interlocking components: Academics, Leadership, Athletics and Bilingualism, each of which is incorporated throughout the formal and informal elements of the RMC programme.

For members of the Canadian Forces who undertake their undergraduate studies at RMC through correspondence, on site at a distance or, at the RMC Campus, the RMC degree provides them with the same fundamental philosophical foundation as the Officer Cadets who complete their studies through one of the subsidized education programmes.

For non-military students, in addition to benefiting from the philosophy governing the four interlocking components, an RMC education provides them with fundamental Canadian values and international values cherished by nations of the free world.

Role

The primary role of the Royal Military College of Canada is to educate and develop Canadians into leaders committed to serving the Canadian Forces and Canada.

Objectives

The objectives of the Royal Military College of Canada are:

- To prepare and motivate Canadians for effective service as commissioned officers in the Canadian Forces by:
 - Providing a university education in both official languages in appropriate disciplines designed on a broad base to meet the unique needs of the Forces,
 - Developing qualities of leadership,
 - Developing a high standard of personal physical fitness, and
 - stimulating an awareness of the ethic of the military profession;
- To improve in appropriate fields the educational background of students who are commissioned officers in the Canadian Forces by providing undergraduate and post-graduate courses in both

- official languages; and
- To foster and encourage faculty participation in research in order to sustain academic excellence. Research with a defence focus is encouraged.

The goal is to produce military leaders dedicated to serving Canada, who are motivated, well educated, ethical, bilingual and physically fit.

The Four Components of an RMC Education

Academics

The Academics Component fosters the critical intellectual skills required to understand the complexities of living in the 21st century. The academic program emphasizes the practical applications of what has been learned to military settings and daily operational demands. All degree programs offered at RMC are designed to provide a sound, balanced, liberal, scientific and military education.

Leadership

The demands of an officer in today's complex rapidly changing security environment are significant. Thus, the Leadership Component develops those personal skills and abilities that lead to success in most of life's endeavors. Leadership training provided by the RMC experience will help students, as they begin their studies at RMC and along with other experiences, prepare them to make difficult decisions under stressful conditions through deeper understanding of the factors affecting their role as a leader. The nature of military leadership and military operations necessitates an in-depth understanding of human behaviour. Therefore, studies in military psychology and leadership are part of the required academic curriculum. Particular emphasis is placed on the importance of personal integrity, ethical behaviour, and professional responsibility.

Athletics

Under the Athletics Component, RMC teaches students the importance of fitness and developing a healthy lifestyle as a lifelong endeavour. Striving for a higher level of physical fitness can inspire those around them and has been shown to improve one's quality of life and learning. Officer Cadets are required to take part in the physical education program designed to achieve and maintain a high level of fitness and to learn the basic fundamentals in a wide variety of team and individual sports.

Bilingualism

The Bilingualism Component reflects Canada's cultural heritage. As representatives of this heritage, Officers are expected to be fluent in both of Canada's official languages - English and French. Your responsibilities as an Officer in the Canadian Forces will require you to lead young Canadians that are primarily Anglophone or Francophone. RMC has been training Officers to communicate effectively in both French and English for well over 30 years. RMC helps make this learning process an interesting one with class time as well as integration into daily life at RMC.

Post Nominal

Students who successfully complete the four interlocking components of the RMC Degree earn the "rmc" - post nominal.

RMC History and Museum

Historical Sketch

In 1874, the Canadian Parliament passed an Act providing for the establishment of an institution "for the purpose of imparting a complete education in all branches of military tactics, fortification, engineering, and general scientific knowledge in subjects connected with and necessary to a thorough knowledge of the military profession, to be known as the Military College, and to be located in one of the garrison towns of Canada". Kingston, with its historical, military, and naval associations, was selected as the site of the proposed College. On 1 June 1876, the Military College of Canada opened its doors to its first class of eighteen gentlemen cadets, soon to be known as the "The Old Eighteen". Two years later, in 1878, Her Majesty, Queen Victoria, granted the College the right to use the prefix "Royal".

The College is located on Point Frederick, a small peninsula immediately east of downtown Kingston and a site of considerable historic interest. In 1789 a naval depot was established on the Point and during the War of 1812 this depot was expanded into the most important military and naval base in Upper Canada. The first College buildings included some of those, from the old naval dockyard. Among them was one known as, the "Stone Frigate", which had been built to store naval gear from warships laid up following the War of 1812. Affectionately known as the Stone Boat by the current generation of cadets, this venerable structure has been in continuous use as a dormitory since the College was opened. The first academic facility was completed in 1878, and is now named the Mackenzie Building, in honour of the founder of the College and Canada's Prime Minister of the day, Alexander Mackenzie. Today it continues in use as the administrative hub of the institution, accommodating the offices of the Commandant, the Principal and the Director of Cadets. Modern buildings now complement those of the earlier period, housing students, faculty, libraries, classrooms, and laboratories.

Since 1880, when the first class of cadets graduated, ex-cadets of the Royal Military College have distinguished themselves in Canada and in many other areas of the British Commonwealth. As early as 1879 the British Government undertook to grant limited number of commissions in the British Regular Army to cadets of the Royal Military College. The first ex-cadet to be killed in action fell at Tambi West Africa in 1892. Ex-cadets have seen service in the North-West Rebellion, in the South African War, on the North West Frontier of India, in the First World War, in the Second World War and in Korea. More recently graduates of the College have participated prominently in Canada's military commitments worldwide - serving in the navy, army, or air force in the Middle East, Asia, Central America, Africa, Eastern and Central Europe and Afghanistan.

"The Royal Military College of Canada Degrees Act, 1959," passed by the 25th Ontario Legislature and given Royal Assent on 26 March 1959, empowers the College to confer degrees and honorary degrees in Arts, Science and Engineering. RMC became institutionally bilingual in the mid-1970's. Co-educational status was achieved in 1980. Between 1948 and 1995, RMC shared with Royal Roads Military College and later with Collège militaire royal de Saint-Jean the responsibility of educating officer cadets for the Canadian Forces. In 1995 our sister colleges, Collège militaire royal de Saint-Jean and Royal Roads Military College were closed, leaving RMC as the only Canadian military college.

Museum

The RMC museum, which was created in its present form in 1962, is housed in the Fort Frederick Martello Tower on the College grounds. Displays are also located throughout the College buildings. The Tower is one of four constructed between 1846 and 1848 to augment the Kingston defences. The museum's holdings include artefacts and records relating to the history of the College and of its graduates as well as to naval dockyard which once occupied Point Frederick, the peninsula upon which the College stands. Amongst the museum's most treasured possession is the superb Douglas Arms Collection.

The museum is open daily to the public in July and August and during the remainder of the year to

school and other group visits by special arrangement.

MUSEUM CONSERVATOR - J.R. McKenzie, CD, rmc, plsc, BA, MA (RMC)
Military Structure of the College
General

All officer cadets who enter the Royal Military College of Canada are enrolled either in the Regular Force (under the ROTP or the UTPNCM) or in the Reserve Component (under the RETP).

All officer cadets enrolled in the Canadian Forces are consequently subject to a code of service discipline. Their life is regulated through orders and instructions which they follow and apply intelligently. Each cadet has access to a copy of the instructions which outline the policy and the procedures governing Cadet Wing activities.

Cadet Wing

The Director of Cadets (DCdts) is the Commanding Officer of the Cadet Wing and is responsible to the Commandant for the overall conduct, supervision, discipline, and the performance of the Cadet Wing. This responsibility is discharged by the various officers and senior non-commissioned officers of the Cadet Wing and civilian staff. The Division Commanders and Squadron Commanders of the Cadet Wing advise, guide, counsel, and evaluate cadets. The Cadet Wing staff is responsible for military training programs for all officer cadets including physical fitness, drill, and officer development. They are also available to answer cadet enquiries and give advice on military matters.

Cadet Organization

The cadets are organized into a Cadet Wing composed of a headquarters and a number of divisions and squadrons, which in turn are subdivided into flights and sections. A separate squadron is comprised solely of students enrolled under the University Training Plan -Non- commissioned Members (UTPNCM). Under the guidance of commissioned officers (the Squadron Commanders) and civilian staff (athletics), this organization controls cadet life at the College within limits laid down by the Commandant.

Senior officer cadets of Third and Fourth year hold staff and command appointments in the Cadet Wing and receive practical training in leadership by being responsible for the discipline, progress, and efficiency of their squadron, flight or section. Cadets also organize and run intramural sports program and carry out typical service duties such as Block Duty Cadet (BDC) and Cadet Wing Duty Officer (CWDO).

Every committee at the College handling cadet affairs has strong cadet representation. This gives the representatives insight into the problems of organizing and administering sports and entertainment, including the budgeting of funds.

Cadet Life at RMC

The life of an officer cadet during the vigorous years at the College is dominated by a program made up of four interlocking components of achievement: academics, military, athletic and bilinguism.

Academics, the most demanding part of this program, are discussed further on in the calendar.

Cadet Military Training

The College is fully residential, the cadets (other than UTPNCM) live together in a military environment. Cadets are responsible for the administration of many of the activities in their life at RMC. This situation gives all cadets the chance to observe the leadership of others and helps them to learn this

art by accepting such responsibilities themselves.

All cadets are required to take part in a demanding routine designed to raise them to a sound standard in physical fitness, drill, and deportment and to develop in them a ready sense of duty, self-discipline, self-confidence and integrity. They are also required to meet the demands for cooperation and teamwork with their fellow cadets.

The officer cadets play an important part in this training, themselves, they are learning much by the experience. Although physically and mentally demanding, this training does not involve personal indignity, illegal punishment, harassment, or "hazing" in any form.

Each cadet entering the college, with the exception of UTPNCM, must pass a number of milestones before being accepted as a full-fledged member of the Cadet Wing. The most significant one, the obstacle course, which is normally run at the end of First Year Orientation Period (FYOP), is designed to prove to the First Year cadet that obstacles which seem insurmountable may, in fact, be overcome through cooperation with others, combined with high level of fitness, individual stamina and determination.

Drill

The Royal Military College of Canada is renowned for the quality and diversity of its ceremonial. The attainment of these high standards is gained through the hard work and dedication of each cadet.

Cadets are expected to reach and maintain a high standard of personal drill with the service rifle, colours, and the sword. A practical test is administered each term to verify that the standard has been maintained. At many times during the year, the Royal Military College of Canada is called upon to provide formations of cadets for ceremonial occasions. Time is found to prepare for these tasks usually during the after duty hours.

Daily Routine

Once classes start, the typical daily routine is as follows:

Time	Monday	Tuesday	Wednesday	Thursday	Friday
0600-0630	Reveille / Ablutions Breakfast (1) (2)	Reveille / Ablutions Breakfast	Reveille / Ablutions Breakfast	Reveille / Ablutions Breakfast	Reveille / Ablutions Breakfast
0630-0720	Band	Squadron Commander's Time (3)	0630-0705 Squadron Muster Parade	Band	Band
0730-0750	Squadron Muster Parade		0715-0950 Professional Military Training	Squadron Muster Parade	Squadron Muster Parade
0800-0850	Period 1	Period 1		Period 1	Period 1
0900-0950	Period 2	Period 2		Period 2	Period 2
1000-1050	Period 3	Period 3	Period 3	Period 3	Period 3
1100-1150	Period 4	Period 4	Period 4	Period 4	Period 4

1200-1230	First Lunch				
1200-1250	Period 5	Period 5	Period 5	Period 5	Period 5
1240-1330	Period 6	Period 6	Period 6	Period 6	Period 6
1300-1330	Second Lunch				
1340-1430	Period 7	Period 7	Period 7	Period 7	Period 7
1440-1530	Period 8	Period 8	Period 8	Period 8	Period 8
1540-1630	Period 9	Period 9	Period 9	Period 9	Period 9
1700-1845	Varsity (4)	Varsity	Varsity	Varsity	Varsity (5)
1700-2140	Academic Tutorials (4)	Intramural Sports 1700-1830 1835-2005 (2010-2140) (6)		Intramural Sports 1700-1830 1835-2005 (2010-2140) (6)	Recreation Clubs 1700-2100
1800		Intramural Waterpolo 1800-2025		Intramural Waterpolo 1800-1935	
1900		Intramural Hockey 1900-2215		Intramural Hockey 1900-2400	
1900-2300	Study Time	Study Time	Study Time	Study Time	
2300-0600	Sleep Time	Sleep Time	Sleep Time	Sleep Time	

Notes:

1. 06:00 is the earliest time that Cadets may be awakened for organized activities.
2. On Monday, Thursday and Friday there are to be no Squadron activities. The sole activity on these days is band. Non-band members may arise at their discretion in time for 07:30 muster parade.
3. If Squadron Commanders plan to do Physical (PT), then they must allow for ablutions and breakfast.
4. Academic tutorials have priority on this evening. No varsity practices or players will attempt to adjust academic schedules or attendance on this evening for the benefit of varsity requirements.
5. Friday is a varsity game night then no practice for that sport will be conducted.
6. This third time period only applies to the winter Term.

Leave

Weekend leaves and evening passes to which a ROTP/RETP officer cadet is entitled may be restricted depending on performance and the demands of training and other duties. New first year officer cadets normally are not permitted leave until Thanksgiving Weekend in October.

Christmas leave for periods of up to three weeks is granted each year.

Varsity Sports

The College is a member of the Ontario Universities Athletic (OUA), one of the four regional associations that make up the Canadian Interuniversity Sports (CIS). RMC currently competes in the following OUA sports:

- basketball (men and women),
- fencing (men and women),
- hockey (men),
- rugby (men),
- soccer (men and women), and
- volleyball (men and women).

These teams also take part in a number of tournaments, as well as the traditional international exchange with West Point (United States Military Academy). RMC also has varsity level teams in Tae Kwon Do and Rugby.

Royal Military College Band

The Royal Military College Band provides a recreational outlet for cadets with musical interests. The Band performs at parades at the College and at Environment Mess Dinners. The Band also participates in a wide range of events such as the Kitchener-Waterloo Oktoberfest Parade, International Highland Games, the local Celtic festival, high school tours, military tattoos, the Spring Concert in Scarlet and numerous other local parades and concerts. The RMC Band is composed of five sections: the Pipes, the Drums, the Brass and Reed, the Highland Dancers and the Choir.

Pipes and Drums section

The Pipes and Drums section is comprised of about 35 pipers and 35 drummers. Basic instruction on bagpipes and drums is provided by two professional Canadian Forces musicians.

Brass and Reed section

The Brass and Reed Band has a membership of about 50 musicians. Instruments are supplied and include flute, clarinet, saxophone, trumpet, trombone, french horn, euphonium, tuba keyboard and percussion. Rehearsals are directed by a professional Canadian Forces musician.

Highland Dancers

The Highland Dance section performs with the Pipes and Drums at Mess Dinners, high school tours and other College functions. Previous experience, although welcome, is not necessary, as novice instruction is available. There are approximately 20 dancers in the section.

Choir

The RMC Choir also performs at Mess Dinners and other College functions including the famous Concert in Scarlet. There are about 40 members in the section

Residence

Single rooms are normally provided for Fourth Year officer cadets. Other senior cadets are allocated single rooms on a space available basis. In the First Year, officer cadets are placed in doubled rooms.

All residences are co-educational. On-campus dining is provided. Full recreational facilities, including an indoor swimming pool, are available in close proximity to the residences. Cadets of the UTPNCM program do not live in residence. Cadets who are married or have common law status may be authorized by their chain of command to live out. Other cadets who want to rent civilian accommodation must ask permission to live out.

RMC Cadet Mess

The RMC Cadet Mess provides facilities for the training of the Cadet Wing in the customs and practices of a Service Mess, and has facilities for social and recreational activities which are an integral part of College life.

The general administration is carried out by a Cadet Mess Committee with cadet representation from all years assisted by a staff advisor from the Cadet Wing. The Mess is conducted in the form of a Service Officers Mess with cadets filling the responsible positions. The RMC Cadet Mess has its own constitution and by-laws where the responsibilities and privileges of its cadet members are explained.

Recreation Clubs

Note: Subject to change depending on interest.

Cycling, yachting, war games, social dance, climbing, windsurfing, astronomy, video editing, photo, arts, fish & game, old 18, jiu-jitsu, karate, precision drill, outdoors, drama, aerobics, aikido, badminton, ladies basketball, broomball, debating, power flying, rowing, and stage band.

Chaplain Services

The Chaplains - Protestant and Roman Catholic - conduct regular Sunday Services of Divine Worship. Officer Cadets and other College personnel and their families are invited to attend all regularly scheduled activities.

Officer Cadets will find during Bible Study groups, padre's hours and at other occasions, opportunities for valuable interchange with the Chaplains and each other on ethical, moral and religious issues. The Chaplains are always available for individual counseling.

Canex

The CANEX is a small store for personal articles, souvenirs, snacks and dry cleaning.

Physical Education And Athletics

Introduction

The RMC Physical Education programme provides opportunities for officer cadets to participate in activities that are physically and mentally stimulating and socially sound. Cadets develop their athletic skills through practice and learn self-control by following the written and implied rules of sportsmanship. As a vehicle to build and exercise the qualities of leadership conducive to officers of the Canadian Forces, the programme includes learning the organizational tasks and duties of officials for selected activities.

Athletics

The athletics program is pursued on two levels: varsity and intramural sports.

Varsity Sports

Varsity sports are designed for those with greater athletic abilities. Suitability for continued involvement by cadets is predicated upon academic performance. Cadets who do not maintain satisfactory academic

and/or military progress may be restricted from regular participation in varsity teams.

First party athletic awards are not offered by RMC to prospective students, nor are benefits or allowances offered as partial or full subsidization for participation as members of intercollegiate teams. As a member in good standing of the CIS and the OUA, RMC is committed to supporting intercollegiate teams that meet the needs of the student body, the college, and the Canadian Forces.

Intramural Sports

The RMC Competitive Intramural Sports Program is an important part of the overall athletic component. It allows students the opportunity for competition in a wide variety of team sports. Intramural participation is compulsory for those cadets who are not part of a varsity team.

Mandatory Physical Education

The mandatory four-year Physical Education Program in which Officer-Cadets take part includes a myriad of activities designed to achieve and maintain a high level of fitness. In addition, the students learn the fundamentals of fitness training in a wide variety of team and individual sports, and military skills. The fitness test, administered three times annually, evaluates five fitness components, which are: endurance, speed, power, agility and strength. All cadets must attain the RMC minimum physical fitness standard for at least two tests per year in order to complete their Athletic program. Moreover, they must achieve the Canadian Forces Military Swim Standard prior to graduation.

Conclusion

The main interdependent segments of the total RMC programme are academics, military training, physical education and second language learning. Academics have always been and will continue to be the most important component of each cadet's education, a process which, at RMC, is built on a foundation of self-discipline and integrity, the basis for the College motto - "Truth - Duty - Valour".

Second Language Training

Second Language Training

The Language Centre is responsible to deliver all second language training for the Officer Cadets.

One of the objectives at RMC is to develop in all Officer Cadets the ability to communicate in both official languages, English and French. An officer must be able to understand, communicate and give orders in both languages. Consequently, second language training is mandatory for all students who do not meet the standards set by the College to the classification tests of the Public Commission.

The Second Language Evaluation System measures three language skills: reading, writing and oral interaction. Each skill is assessed at five levels of language proficiency: X, A, B, C and E. Upon arrival at RMC, students are tested in order to place them in a class appropriate for their level and ability. Small, homogeneous classes, usually composed of an average of eight students are created to give students the opportunity to progress according to their abilities, to interact and enhance their learning. Five 50-minute periods of instruction are given every week as part of the regular study program.

Once they have achieved the BBB level or better, the required standard for graduation, students are exempted from Second Language Training. However, they are strongly encouraged to maintain and improve their language skills, by engaging in further formal training in their second language. RMC, being a bilingual institution, allows students to register in courses in the language of their choice.

Students who do not achieve the BBB level by the end of the first academic year will take an intensive ten-week summer course of about 250 hours.

To increase exposure to the second language and to underline the bilingual nature of RMC activities at the college are conducted in both official languages. There are, for example, English weeks and French weeks during which students have the opportunity and are encouraged to work in their second language. As well, students are expected to spend a reasonable amount of time studying outside classroom hours. All publications, orders and routines are given in the language of the week to encourage practice to the extent permitted. First year Anglophone students and first year Francophone students share rooms in order to facilitate communication in both languages.

Summer Training

General

A major part of an RMC cadet's military development takes place during the summer. Every summer, all officer cadets participate in up to eleven weeks of military training designed to prepare them to assume specific duties as officers of the Canadian Forces after graduation from the College. While summer training is not the responsibility of the College, the results are closely monitored and form part of a cadet's College training record.

Leave

Every effort is made to grant 14 consecutive working days of annual leave during the summer months before or after the summer training period.

Pay

During this summer period all cadets (ROTP, RETP and UTPNCM) receive pay and allowances as prescribed.

Basic Officer Training (BOT)

This training is common for all cadets and is taken in two parts. The first part, the Initial Assessment Period (IAP), is done during a nine-week period prior to the start of the First Year academic term. The second part, the Basic officer Training Programme (BOTP), includes further military training conducted during the academic year. The aim of Basic Officer Training is to develop in the officer cadets essential officer-like qualities and to provide an introduction to those common military subjects essential to the employment of all officers in the Forces. During BOT, cadets receive instruction in weapons, map using, leadership theory and exercise, first aid, general service knowledge, and military writing.

Phases II, III And IV

During summers following the Second, Third, and Fourth Years, officer cadets receive further formal military training in the form of Phase training, Summer Second Language training (SSLT), or on-the-job training (OJT). The training undertaken in Phase II, III, and IV summers is designed to prepare the cadet for a specialized military occupation.

General Structure of the University

The Board Of Governors

The RMC Board of Governors was established in 1997. Its role is to review and approve the strategic direction of the College, and to provide advice to the Minister of National Defence on all matters relating to the College as required.

The Senate

The Senate was created by the Royal Military College of Canada Degrees Act, 1959, and is composed of the President, the Commandant, the Principal, the Deans of the Academic Faculties, the Director of Cadets, and the Registrar. Its function is to grant degrees and honorary degrees.

The Faculty Council

The Faculty Council is composed of the Principal as Chair, the Registrar as Secretary, the Deans of Faculties, the Heads or Acting Heads of the various Departments, the Director of Cadets, and other members of the Senior Staff designated by the Chair. Its function is to determine on all matters of an educational character including all courses of study, the Library, and the Calendar, to conduct examinations, to recommend to the Senate the candidates for degrees and diplomas, to award College medals, prizes and scholarships and generally to make such recommendations to the Commandant as may be deemed expedient for promoting the interests of the College.

The Faculty Board

The Faculty Board is composed of the Principal as Chair, the Professors, the Associate Professors, the Assistant Professors, the Lecturers, the Chief Librarian, the Registrar, the Director of Administration, the Director of Cadets, the Officers of the Military Wing, all other members of the senior staff designated by the Chair, and students representing the student body invited by the Chair to attend. The function of the Faculty Board is to deal with examination results of undergraduate students; to make recommendations to the Faculty Council on honours standing and academic failures; to exercise academic supervision of students; to make recommendations to the Commandant on Cadet Wing appointments; and to make recommendations to Faculty Council or the Commandant on any matter affecting the general interest of the College.

Library

General Information

The RMC Library serves the need for information services and to support the research work of students and staff.

The Library houses a substantial collection of books, government documents, journals, technical reports, microforms, video/audio cassettes, CDs and DVDs and special collections. The special collections consist of monographs, prints, photographs and archival material, including the RMC Archives. Of particular significance is the John W. Spurr Military Studies Collection, which includes an extensive collection of Canadian, British, French and German military history. The science and engineering part of the collection covers chemistry, physics, mathematics, computer science, and ocean, space, environmental, military and nuclear sciences and seven engineering fields. The book stacks are open to the public but borrowing privileges are restricted to authorized users.

Study areas, microform readers/printers, photocopiers, reference and interlibrary loan services and on-line searching in the major databases are available, as well as a good selection of other electronic resources.

The RMC Library being a constituent member of a bilingual institution, is committed to collect and to offer all library services in both official languages.

Computing Facilities

General Information

A number of up-to-date micro computer and work station laboratories managed by Computing Services support scheduled teaching activity and individual study. These laboratories are integrated into local area networks. Access to various network services, including information services available through the Internet, is granted through a system of accounts. Services provided by the Library computer are accessible via the local area networks. Users of the various computing systems are subject to the guidelines established by Faculty Council in the Code of Ethics.

A student may be required to purchase and maintain a personal computer, associated peripherals, and

software which satisfy the specifications established for the programme in which the student is enrolled. Several departments provide micro computer laboratories dedicated to their own programs of study.

Slowpoke-2 Nuclear Reactor And Facility

General Information

The "SLOWPOKE-2" nuclear reactor and facility is located in Module 5 of the Sawyer Building. Installed in 1985, this research reactor is operated by the Department of Chemistry and Chemical Engineering for the Department of National Defence. The reactor and the associated laboratory equipment are used for the education of undergraduate and postgraduate students, for research and analytical applications, and for training and support of DND personnel. Specific capabilities include neutron activation analysis, neutron radiography, liquid scintillation counting, and low-level and transportable gamma spectrometry.

Agreement Between RMC And Queen's University

General Information

Long-standing co-operative ventures with Queen's have now been extended to undergraduate courses. Cadets at RMC and students at Queen's may now, subject to Departmental approval, take undergraduate courses at the other institution and count these courses as credits towards their degrees. Normally, the choice of courses will be limited to Third and Fourth Year courses.

Admission Guidelines

General Information

General Qualifications

For admission to The Royal Military College of Canada (RMC) an individual must:

1. Be a Canadian citizen, or authorized by the Canadian government; and,
2. Possess the necessary academic qualifications for the academic program that the individual is applying for.

Applicants must also meet one of the following conditions:

- Be an MOC (Military Occupation Classification) qualified member of the Canadian Forces (CF), including members of the Reserve Forces. Non MOC qualified members may apply with the recommendation of their unit or formation Commander; or
- Be an applicant for the Regular Officer Training Plan (ROTP) or the Reserve Entry Training Plan (RETP); or
- Be an employee of the Department of National Defence (DND), or
- Be a spouse of a member of the CF.

Individuals who have no affiliation with DND and who have successfully completed their high school studies or meet the general conditions for admission as mature students may also apply for admission through the Division of Continuing Studies (DCS), and may be accepted into an undergraduate programme of study at RMC on an exceptional basis and provided there is space available in the programme of their choice and their admission serves the aims established for RMC.

Admission Options

Students interested in pursuing their Undergraduate studies at RMC have the following admission

options:

- Apply for full time admission under the Regular Officer Training Plan (ROTP);
- Apply for full time admission under the Reserve Entry Training Plan (RETP);
- Apply for full time admission under the University Training Plan - Non Commissioned Members (UTPNM);
- Apply for full time admission under the Initial Baccalaureate Degree Program (IBDP); or
- Apply for full time or part admission through the Division of Continuing Studies (DCS).

Admission Plans

ROTP and RETP

Civilian students wishing to pursue full time undergraduate studies and a career as an officer in the Canadian Forces may do so under the auspices of the Regular Officer Training Plan (ROTP) or the Reserve Entry Training Plan (RETP). The purpose of either program is to develop selected civilian candidates for service in the Regular and Reserve Forces. Students therefore apply for enrolment into the Canadian Forces at a Canadian Forces Recruiting Center and apply for the ROTP or RETP as part of the enrolment process.

Regular Officer Training Plan (ROTP)

The ROTP gives young Canadians the opportunity to obtain both a commission as an officer in the Canadian Forces and a university degree. Applicants who have been accepted for entry at RMC enrol as officer cadets in the Canadian Forces.

Under ROTP, the costs of tuition, uniforms, books, instruments and other essential fees are born by the Department of National Defence for the duration of a candidate's education at RMC. In addition, an officer cadet is paid a monthly salary, less deductions for income tax, pension plan, supplementary death benefit, and, room and board. Medical and dental care are provided free of charge throughout the entire academic year including summer training periods. Annual vacation leave with full pay is granted according to CF regulations and policies.

An Officer Cadet is obliged to maintain a satisfactory academic and military standard throughout the entire programme. Officer Cadets who fail to meet these standards may be permitted to "repeat" one year of studies as their own expense and, if successful, be reinstated to full pay and allowances.

Upon successful completion of the ROTP, Officer Cadets are awarded a university degree and granted a commission as officers in the Canadian Forces. Graduates of the ROTP are obliged to serve three to five years (depending on the number of years of subsidized education) in a regular component of the Canadian Forces.

An Officer Cadet who is enrolled under the ROTP may apply for release without any obligation after the 1st of November of the first academic year and prior to the commencement of classes in their second year of studies. Thereafter, an Officer Cadet who seeks release shall undertake to reimburse the Crown for all expenses incurred by reason of attendance at RMC.

Reserve Entry Training Plan (RETP)

The purpose of the Reserve Entry Training Plan is to educate and train selected Primary Reserve candidates at the Royal Military College of Canada. Successful candidates will become officers in the Reserve Force or may be considered for transfer into the Regular Force. Up to 15 students may be

accepted each year as "Reserve Entry" cadets. Reserve Entry cadets receive the same education and training as ROTP cadets. However, RETP academic training is not subsidized and candidates are required to pay tuition and other academic fees and room and board. RETP candidates are required to take summer training for which they receive pay and allowances at the same rate as a Second Lieutenant on "Class B" reserve service. (refer to any Canadian Forces Recruiting Center for the current rate of pay and allowances)

The eligibility requirements for students pursuing admission to RMC under the ROTP or RETP are as follows:

1. Must be a Canadian citizen at the time of application;
2. Must be 16 years of age on or before 1 Jan of the year of enrolment;
3. Must meet the medical standards for the Canadian Forces;
4. Must obtain an acceptable standard in a series of tests as prescribed the National Defence Headquarters; and,
5. Must possess the necessary academic qualifications for RMC as specified in the admission pre-requisites outlined further below.

Tuition and Fees (RETP Candidates)

- an annual tuition
- Room and board and;
- Annual Mess and other recreational fee;

Information concerning these fees can be found at: [Fees Table](#)

Payment of fees and costs can be arranged in two instalments, the first upon registration and the second by the following 31 January.

University Training Plan NCMs (UTPNCM)

The University Training Plan Non-Commissioned Members (UTPNCM) is a CF sponsored subsidization plan open to certain non-commissioned members of the regular force who meet the academic requirements for admission to RMC as candidates for a baccalaureate degree. Depending on their level of academic standing UTPNCM candidates may enter at the First Year level or with advanced standing. Except for certain allowances made for age, service experience, and marital status, these Officer Cadets must meet substantially the same academic and military-training requirements as those in the ROTP and RETP. On graduation, both groups of Officer Candidates are commissioned and promoted. The conditions governing, eligibility, application, selection procedures are set forth in Canadian Forces Administrative Orders 9-13 and may be amended or modified by subsequent orders.

Initial Baccalaureate Degree Program (IBDP)

The IBDP is a CF sponsored subsidization plan open to commissioned officers serving the Canadian Forces who are within two years of meeting the course requirements for a baccalaureate degree at RMC. Thus, all students admitted under this plan must enter as candidates with advanced standing. The conditions governing eligibility, application and selection procedures are set forth in Canadian Forces Administrative Order 9-40, and may be amended or modified by subsequent orders.

Other Students

Other students seeking to complete their undergraduate degree at RMC normally would apply for admission to RMC through the Division of Continuing Studies. The Division of Continuing Studies is responsible for the administration and delivery of several undergraduate programmes specifically

designed for students who study primarily at a distance either by correspondence, on-site at a distance or via the internet.

Visiting Students

Students already enrolled in another university programme may take register for courses at RMC through the Division of Continuing Studies as a visiting student. This is subject to approval by the Division of Continuing Studies.

A written request must be submitted to the Division of Continuing Studies prior to the registration deadline. Visiting students must ensure that they get permission from their institution so that credits earned from RMC can be transferred to their original institution.

Interest Only Students

Interest Only Students are students who enrol in a course without being admitted into a Programme of Study at RMC or another university. These students must also fill out and send to the Registrar's Office - Admissions the Application for Admission into an Undergraduate Programme of Study, along with the requisite documentation (i.e., college and university transcripts as well as a summary of studies, indicating the time and place at which these studies were pursued) and payment of the application processing fee, so that the competent academic authorities at RMC may ascertain that the Interest Only Student has met the prerequisite for the course or courses in which the applicant is seeking enrolment. The current RMC academic regulations limit to three in any given term the number of courses an Interest Only Student may enrol in, and to six in total the number of undergraduate credits an Interest Only Student may obtain at RMC. If an Interest Only Student has obtained the maximum of six credits at RMC, the student will be required to seek admission into a programme of study before being allowed to register in another course at RMC.

Mature Students

Applications from mature students 23 years of age will be considered on their individual merit. Mature students applying for admission must submit a letter describing their background, experience, and educational goals.

Admission of mature students is limited to the Faculty of Arts. Mature students who intend to pursue their baccalaureate degrees in Science or Engineering, may only be admitted to these faculties once they have successfully completed 2 full university courses, or have been accredited with the equivalent of 2 full university courses and meet the academic pre-requisites of the programme of interest

Academic Prerequisites

General Prerequisites

There are four programme options are offered at the Royal Military College:

1. The Arts option which leads to degrees in Arts, Business Administration;
2. The Science option which leads to degrees in Science;
3. The Engineering option which leads to degrees in Engineering and;
4. The Bachelor of Military Arts and Science, a unique degree programme for the Canadian Forces offered through RMC's Division of Continuing Studies and specifically designed for the serving military member recognizing university-level achievement appropriate to the profession of arms.

An applicant for admission to one of these options must be completing or have completed:

- High school (Grade 12) at a pre-university level satisfactory to RMC with credits acceptable and sufficient for regular admission to a university in the province in which the student is completing secondary education. Grade 12 high school;
- Secondary V (Quebec students) or Quebec College of General and Vocational Education (CEGEP) and must be completing or have completed the first year of a two-year pre-university program and will normally be expected to offer 14 credit courses. Quebec students who have completed Sec V will complete a five-year undergraduate program which includes first year CEGEP at RMC's Campus Fort St-Jean in Quebec followed by university studies at the RMC Campus;
- The equivalent to grade 12 high school or CEGEP 1;
- Possess academic standards higher than those specified above; or,
- Meet the conditions for admission as a mature student.

Candidates should be aware that all programmes are of four-year duration (five years for Sec V Quebec students), and are broadly based; Engineering and Science programmes include several courses in the Humanities, while student in Arts are required to successfully undertake university level courses in mathematics and the sciences. The requirements for admission to each of the programmes are summarized below.

The Bachelor of Military Arts and Science is a unique undergraduate degree programme for the CF, is thoroughly grounded in the military profession and integrates in-service training with special and standard university courses. It is designed for the serving military member, and recognizes university-level achievement appropriate to the profession of arms.

Academic Prerequisites by Programme

Bachelor of Arts

In addition to the general academic qualifications applicants for admission to the Arts programme must have completed a university preparatory English or French course at the High School leaving level (normally the Grade 12 or the provincial equivalent). A grade 12 university preparatory course in mathematics (preferably Calculus) is strongly recommended. Students must have completed a Grade 11 mathematics at the university preparatory level. Students who have not completed a Grade 12 Chemistry and Physics will be required to complete makeup courses as part of their RMC programme. Students who do not meet these minimum pre-requisites may be admitted as mature students.

Bachelor of Science

In addition to the general academic qualifications, applicants for the Science programme must have completed a university preparatory course at the High School leaving level (normally Grade 12 provincial equivalent) in the following subjects: English, Mathematics, (Calculus, and of Algebra, Geometry, or Trigonometry if available within the provincial system) and one of Chemistry, Physics or Biology. (Note: Chemistry is required for a major concentration in Chemistry and Physics is required for a major concentration in Physics and Space Science.)

Bachelor of Engineering

In additions to the general academic qualifications applicants for the Engineering programme must have completed a university preparatory course at the High School leaving level (normally Grade 12 provincial equivalent) in the following subjects: English, Mathematics,

(Algebra/Geometry/Trigonometry and Calculus if available within the provincial system), Chemistry and Physics.

Bachelor of Military Arts and Science

In addition to the general academic qualifications applicants for admission to the Bachelor of Military Arts and Science programme must have completed a university preparatory English or French course at the High School leaving level (normally the Grade 12 or the provincial equivalent). Students who do not meet these minimum pre-requisites may be admitted as mature students.

Required Academic Subjects by Province

BC and Yukon	
ARTS	English 12; Mathematics 11 - Principles or Applications; or Mathematics 12 - Principles; or Calculus
SCIENCE	English 12; Mathematics 12 - Principles; and Calculus 12 - (where available); Chemistry 12; or Physics 12; or Biology 12
ENGINEERING	English 12; Mathematics 12 - Principles; and Calculus 12 - (where available); Chemistry 12; Physics 12

Alberta, Northwest Territories and Nunavut	
ARTS	English 30-1; Pure Mathematics 20 or 30 or 31;
SCIENCE	English 30-1; Pure Mathematics 30 and 31; Chemistry 30; or Physics 30; or Biology 30
ENGINEERING	English 30-1; Pure Mathematics 30 and 31; Chemistry 30; Physics 30

Saskatchewan	
ARTS	English A30 and B30; Mathematics 20 or A30 or B30 or C30
SCIENCE	English A30 and B30; Mathematics 40S Pre-Calculus; Chemistry 40; or Physics 40; or Biology 40
ENGINEERING	English A30 and B30; Mathematics 40S Pre-Calculus; Chemistry 40; Physics 40

Manitoba	
ARTS	English 40; Mathematics 30S Pre-Calculus; or 40S Pre-Calculus
SCIENCE	English 40; Mathematics 40S Pre-Calculus; Chemistry 40; or Physics 40; or Biology 30S;
ENGINEERING	English 40; Mathematics 40S Pre-Calculus; Chemistry 40; Physics 40

Ontario	
ARTS	English 12U; Mathematics 11U or 11M or 12U Functions and Intro Calculus; or 12U Geometry and Discrete Mathematics
SCIENCE	English 12U; Mathematics 12U - Functions and Intro Calculus; and Mathematics 12U - Geometry and Discrete Mathematics; Chemistry 12U; or Physics 12U; or Biology 12U
ENGINEERING	English 12U; Mathematics 12U - Functions and Intro Calculus; and Mathematics 12U - Geometry and Discrete Mathematics; Chemistry 12U; Physics 12U;

New Brunswick	
English Sector	
ARTS	English 121 or 122; Mathematics 111 or 112 or 120 Advanced or 120 Calculus
SCIENCE	English 121 or 122; Mathematics 120 Advanced; and Mathematics 120; Calculus; Physics 121 or 122; or Chemistry 121 or 122; or Biology 120
ENGINEERING	English 121; or 122; Mathematics 120 Advanced; Mathematics 120; Calculus; Physics 121 or 122; Chemistry 121 or 122
French Sector	
ARTS	French 10411; Mathematics 30321 or 30411 or 30412
SCIENCE	French 10411; Mathematics 30411; Mathematics 30421; Physics 51411; or Chemistry 52411; or Biology
ENGINEERING	French 10411; Mathematics 30411; Mathematics 30421; Physics 51411; Chemistry 54211;

Nova Scotia	
ARTS	English 12; Advanced Mathematics 11 or 12; or Mathematics 11 or 12
SCIENCE	English 12; Pre-Calculus 12; or Advanced Mathematics 12; Chemistry 12; or Physics 12; or Biology 12
ENGINEERING	English 12; Pre-Calculus 12; Advanced Mathematics 12; Chemistry 12; Physics 12; Biology 12

Prince Edward Island	
ARTS	English 621A; Mathematics 521B or 521; or Mathematics 611B or 621A
SCIENCE	English 621A; Mathematics 611B, 621B; Chemistry 621; or Physics 621; or Biology 621
ENGINEERING	English 621A; Mathematics 611B and 621B; Chemistry 621; Physics 621

Newfoundland	
ARTS	English 3201; Mathematics 2205 or 2204 or 3205 or 3207
SCIENCE	English 3201; Mathematics 3205, 3207; Chemistry 3202; or Physics 3204; or Biology 3201;
ENGINEERING	English 3201; Mathematics 3205; and 3207; Chemistry 3202; Physics 3204

Province of Quebec

There are two admission entry options for students from the province of Quebec.

1. Students can be admitted to First Year RMC if they have successfully completed the first year of a two-year DEC Diploma from an accredited CEGEP.
2. Students who have completed their two-year DEC Diploma may be admitted with advance

standing. The admission criteria for CEGEP students are as follows:

ARTS	English (French)- 2 core courses; Mathematics - Secondary V 536 or 526; or CEGEP 1 level Mathematics in Calculus; or Algebra
SCIENCE	English (French) 2 core courses; Mathematics - two of: 201-GGF-05, NYA-05, 201-NYC-05, 201-NYB-05; Chemistry 202-NYA-05; or Physics 203-NYA-05; or Biology 101-NYA-05
ENGINEERING	English (French)- 2 core courses; Mathematics - two of: 201-GGF-05, NYA-05, 201-NYC-05, 201-NYB-05; Chemistry 02-NYA-05; Physics 203-NYA-05; Biology 101-NYA-05

Quebec students applying for admission with a SEC V Quebec will be admitted to RMC and will begin their undergraduate studies by completing CEGEP 1 at RMC's satellite campus in St-Jean Quebec. To be admitted under this option students must be completing or have completed high school (Secondary V) with a sufficient number of acceptable credits for admission to a CEGEP and have the academic prerequisites, or their equivalents, listed below:

Social Science (destined for Arts degrees)

- English or French, Mathematics 526 or 536

Science (destined for Engineering or Science degrees)

- English or French, Mathematics 536, Chemistry 534 Physics 534

Non Canadian Education Systems

Students who complete secondary school through education systems outside of Canada, or through "home" schooling will be considered individually but will be required to meet the equivalent standards to those indicated above. All applicants must possess the equivalent of a high school diploma. Additionally, students must offer acceptable results in the Scholastic Aptitude Tests (SATs) as follows:

- **For a diploma in Arts**

The SAT Reasoning Test and the SAT Subject Tests in English (Literature) and Mathematics Level 1.

- **For a diploma in Science**

The SAT Reasoning Test and the SAT Subject Tests in English (Literature), Mathematics Level 1 and 2, and one Science Subject Test in either, Biology E/M, Chemistry or Physics.

- **For a diploma in Engineering**

The SAT Reasoning Test and the SAT Subject Tests in English, Mathematics Level 1 and 2, Physics and Chemistry.

International Baccalaureate Programme (IB):

Students who have earned the IB diploma must still have completed a high school diploma in a university preparation program and meet the conditions outlined above. Candidates granted the IB

Diploma may receive transfer credits on the basis of subjects completed with a grade of 5 or better.

Students who have not earned a high school diploma but have successfully earned the IB Diploma may be considered for admission as follows:

- **Arts Programme**

Full-Diploma candidates who pass six subjects with at least three at the Higher Level, and who accumulate a grade total of 28, exclusive of bonus points, may be considered for admission. Higher level English must be taken at least at the Subsidiary Level.

- **Science/Engineering Programme**

Full-Diploma students will with an overall total of 28 grade points or better, exclusive of bonus points, may be considered for admission. Mathematics, Chemistry and Physics taken at the Higher Level are preferred; however, one of the above may be taken at the Subsidiary Level. English must be taken at least at the Subsidiary Level.

Admissions Restriction

The Royal Military College of Canada reserves the right to reject applicants on the basis of their overall academic record, even where entrance requirements have technically been met. Normally a candidate who has been required to withdraw from another university or college for academic reasons will not be considered for admission until a full academic year has elapsed.

Admission Procedure

All Military and Civilian Applicants

All Military and Civilian Applicants All individuals interested in pursuing their undergraduate studies at the Royal Military College of Canada must apply for admission to the undergraduate degree of their choice. All military applicants, including those enrolled under the Continuing Education Officer Training Plan (CEOTP) and civilians wishing to be considered for admission into an Undergraduate programme of Study must complete and submit an Undergraduate Studies Application - along with supporting documentation to the Registrar's Office - Admissions.

Every applicant must include the following documentation:

- Official transcripts of all high school, college, CEGEP, or university courses completed;
- If a Regular CF member, a Military Personnel Record Resume (MPRR) (formerly CF490A);
- If a Reserve CF member, a CF 1007 Record of Service;
- If a spouse of a Regular CF member, a copy of your spouse's MPRR;
- If a full time civilian employee of DND, a copy of the letter of offer;
- If applying as a mature student, a one-page summary of the professional background, experience and educational goals desired; and
- Payment of the administrative fee for the processing of an application for admission

ROTP and RETP Applicants

Civilian applicants wishing to pursue their undergraduate degrees at RMC through the subsidized programs:

- Regular Officer Training Plan (ROTP); or

- Reserve Entry Training Plan (RETP)

must apply in person to a Canadian Forces Recruiting Center. Applications should be made as early as possible, and all documentation should be submitted without necessarily waiting for the results of the first set of examinations in the final year of high school. However, the Canadian Forces Recruiting Center will require the applicant's co-operation in furnishing high school transcripts and in arranging the earliest possible receipt of final marks for the present school year.

The deadline for application for admission under the ROTP or RETP is normally in early February of the academic year. Information concerning the application process may be obtained from any Canadian Forces Recruiting Center (CFRC) at 1-800-856-8488 or at: www.recruiting.forces.gc.ca

To be eligible for enrolment into the Canadian Forces and to be admitted to RMC ROTP/RETP applicants must meet the following conditions:

- Be a Canadian citizen;
- Be 16 years of age;
- Meet the minimum medical standard required for enrolment into the Canadian Forces;
- Pass pre-enrolment tests
- Pass the Initial Assessment and Basic Officer Training Period
- Possess the necessary academic qualifications outlined above.

Military Applicants

All military applicants wishing to pursue their undergraduate degrees at RMC through the:

- University Training Plan Non-Commissioned Member (UTPNCM);
- Initial Baccalaureate Degree Programme (IBDP);
- Army Officer Degree Programme (AODP); or
- Air Force Degree Completion Program (AFDCOMP)

must submit their candidacy for these programs to their chain-of-command in concurrence with the annual competition for these programs. For IBDP, AODP, AFDCOMP students requiring confirmation of current academic standing it is suggested that application for admission to RMC occurs well in advance of applying for the intended program.

Accreditation

Introduction

The Royal Military College of Canada recognises that significant university level learning can take place outside of post secondary institutions and as such respects all forms of learning no matter how it is attained.

The aim of RMC Prior Learning Assessment & Recognition is to acknowledge the importance of this learning by providing an accessible, fair and academically rigorous process for assessing this learning to determine whether it meets the standards of university level learning.

The RMC PLAR process involves individual assessment of prior learning by faculty and the awarding of credit when this learning is of the expected range and depth for the particular academic credential requested by the individual.

The purpose of the PLAR process is to recognize all university level learning by ensuring that RMC

policies are in line with other Canadian universities.

The goal is to enrich the learning experience of the student and help the student meet his/her academic potential while at the same time maintaining the academic integrity of the Royal Military College of Canada.

Prior Learning Assessment & Recognition (PLAR)

Students applying for admission into a programme of study who have completed programmes or courses at other universities, community colleges, or CEGEP or professional training courses taken either within the CF or through some other organization (whether in Canada or abroad), may seek to have their prior learning at a university level recognized by RMC.

For sponsored students, in order to ensure that prior learning is assessed in time to apply results to first year scheduling, a copy of student transcripts, course descriptions, and outlines for courses for which recognition is being requested must be forwarded to the RMC PLAR section immediately upon acceptance to RMC. Requests, therefore, should be forwarded before leaving for the Basic Officer Training Course.

University Transfer Credits

Credit for University courses taken at a recognized Canadian university may be granted one for one as unallocated credits in any RMC degree, however, in order for credit to be applied to a specific concentration or minor, or to replace specific courses listed as part of a programme, departmental approval is required.

College Transfer Credits

Up to a maximum of 10 transfer credits may be granted for College courses (unless otherwise approved for a specific diploma or programme) based on provincial college to university transfer guides and course reviews completed by faculty and approved by Deans. In order for any college course to be used to meet the requirements of a specific RMC course (equivalency) or to be applied as part of a minor or concentration, approval of the applicable department is required.

CEGEP Transfer Credits

Up to a maximum of 10 transfer credits may be granted for CEGEP courses based on the following PLAR policy:

- Students who have completed a 2-year CEGEP DEC will earn a total of 10 credits. These will consist of Science credits as approved on the RMC Table of CEGEP Science Equivalences; Arts course equivalencies as recommended by faculty and approved by the Dean of Arts; and unallocated Arts credits.
- Students who have not completed a 2-year CEGEP DEC but have earned at least 12 CEGEP credits (excluding physical education credits) may earn a total of 10 credits. These will consist of unallocated Arts credit based on evidence that the given CEGEP course(s) earns credit at any Canadian University and Science credits as approved on the RMC Table of CEGEP Science Equivalences.
- Students who have not completed a 2-year CEGEP DEC, nor a minimum of 12 CEGEP credits, may earn up to a total of 10 credits consisting of Science credits as approved on the RMC Table of CEGEP Science Equivalences and Arts course equivalencies as recommended by faculty and approved by the Dean of Arts.

- Students who have completed at least four CEGEP literature courses in English or French literature with a grade of C or higher in three of the four courses and a C- in the fourth course will earn one unallocated Arts credit. If they have earned a C or higher in all four courses, they will earn 2 unallocated Arts credits. These credits may be used to meet the literature requirements of the BMASc Honours, BMASc, and General three-year degrees. Students in any other Honours degree meeting these criteria may request to write a challenge exam to meet their first year literature requirement.

In order for any CEGEP course to be used to meet the requirements of a specific RMC course (equivalency) or to be applied as part of a minor or concentration, approval of the applicable department is required.

A list of approved CEGEP Science course equivalences is found on the [RMC Table of CEGEP Science Equivalences](#).

Credit Granted

The Faculty Council of RMC, on the recommendation of a department, the Continuing Studies Committee and the Faculty Board of RMC, may approve university credits based on university level prior learning obtained via any of the following:

- Military training and qualifications training, whether obtained within Canada or abroad, recognized as learning at a university level;
- Professional training courses or programmes given by an organization other than a post-secondary institution recognized as learning at the university level;
- The combination of Military training and RMC courses designated as "top-up" courses to be completed to augment specific military training and experience to the university-level.

A list of approved courses is found on the [RMC Table of Credit Granted](#)

Second Language Credits:

Credits granted based on students achieving the bilingual standard (BBB) and higher on official language tests.

- **Honours Degrees**

Students completing Honours degrees achieving the bilingual standard (BBB) on official language tests will be awarded an unallocated junior credit with a mark of 90 percent. For comprehension, writing, and speaking, students will be awarded an additional credit with a mark of 90% for each score indicating fluency or better (C or E). A maximum of four such credits will be awarded for a student's second official language. A further two credits may be awarded on the same basis for other languages, subject to formal testing, for a maximum of 6 second language credits. All BBB and above credits will normally be allocated to the third year in a four year *full-time* program. Credits achieved in fourth year will be applied to that year.

- **General Degrees**

Students completing General degrees achieving the bilingual standard (BBB) on official language tests will be awarded an unallocated junior credit on their initial assessment. For comprehension, writing, and speaking, students will be awarded an additional credit for each

score indicating fluency or better (C or E). A maximum of four such credits will be awarded for a student's second official language. A further two credits may be awarded on the same basis for other languages, subject to formal testing, for a maximum of 6 second language credits.

Credits granted on this basis are annotated on the transcript with the code "SL".

Documentation Required for Transfer Credit Review

In order to complete a PLAR review for transfer credits the following documentation is required immediately upon acceptance to RMC for sponsored on site students and as part of the Admissions application for distance learning students:

- Official Transcripts from the post-secondary institutions, whether universities, colleges or CEGEP, at which programmes or courses have been completed;
- Course Outlines for CEGEP and College courses as requested;
- Course Descriptions for University courses to be reviewed.
- Request for Advanced Standing (Transfer Credits) Application Form

For PLAR review applicants who are not sponsored students please complete the Request for Transfer Credits section of the [Request for Advanced Standing](#) form, including payment information, and FAX to the Admissions FAX number provided on the form.

For sponsored students, in order to ensure that prior learning is assessed in time to apply results to first year scheduling, a copy of student transcripts, course descriptions, and outlines for courses for which recognition is being requested must be forwarded to the RMC PLAR section immediately upon acceptance to RMC. Requests, therefore, should be forwarded before leaving for the Basic Officer Training Course.

Documentation Required for Credit Granted Review

In order to complete a PLAR review for credit granted the following documentation is required immediately upon acceptance to RMC for sponsored on site students and as part of the Admissions application for distance learning students:

- A Military personnel Record Resume (MPRR) for Regular Force Members;
- A Record of Service for Reserve Force Members;
- Course Training Reports for courses listed on the RMC Table of Credit Granted;
- Course Training Plan and Course Material for DND courses not on the RMC Table of Credit Granted;
- Certificate of Completion for Professional level courses;
- Course Manual and Course Material for non-DND Professional level courses not on the RMC Table of Credit Granted.
- Request for Advanced Standing (Credit Granted) Application Form

For PLAR review applicants who are not sponsored students please complete the Request for Credit Granted section of the [Request for Advanced Standing](#) form, including payment information, and FAX to the Admissions FAX number provided on the form.

For sponsored students, in order to ensure that prior learning is assessed in time to apply results to first year scheduling, a copy of student transcripts, course descriptions, and outlines for courses for which recognition is being requested must be forwarded to the RMC PLAR section immediately upon acceptance to RMC. Requests, therefore, should be forwarded before leaving for the Basic Officer Training Course.

Academic Programmes

Academic Programmes

Degrees Programmes Offered

The Royal Military College offers academic programmes leading to the undergraduate degrees listed below. It should be noted that not all programmes are open to cadets under the ROTP and RETP entry plans.

Academic Programmes

Degree Programme	Concentration or Specialization	Academic Years (or equivalent) to complete
Bachelor of Arts (Honours) BA (Honours)	<ul style="list-style-type: none"> English French History Politics¹ Economics¹ Military and Strategic Studies Business Administration² Psychology 	4
Bachelor of Arts (BA) with Major concentration	<ul style="list-style-type: none"> English French History Politics¹ Economics¹ Military and Strategic Studies Business Administration Psychology 	4
Bachelor of Arts (BA) ³	No Major concentration Minor concentration only	3
Bachelor of Science (Honours) BSc (Honours)	<ul style="list-style-type: none"> Chemistry Mathematics Computer Science Science Physics Space Science Or combination of two Honours 	4
Bachelor of Science (BSc) with Major concentration	<ul style="list-style-type: none"> Chemistry Computer Science Mathematics Physics Space Science 	4

	<ul style="list-style-type: none"> • Or combination of two Majors 	
Bachelor of Science (BSc) ³	No Major concentration Minor concentration only	3
Bachelor of Engineering (BEng)	<ul style="list-style-type: none"> • Chemical Engineering • Civil Engineering • Computer Engineering • Electrical Engineering • Mechanical Engineering • Aeronautical Engineering 	
Bachelor of Military Arts and Science (Honours) (BMASc(Honours)) ⁴	No Major concentration	4
Bachelor of Military Arts and Science (BMASc) ⁴	No Major concentration	3

Notes:

1. For students commencing 2nd Year prior to September 2002, only a combined major in Politics and Economics is offered.
2. The BA (Honours) programme in Business Administration was introduced in September 2002 and is not open to students who commenced 2nd Year Business Administration prior to this date.
3. The general BA and BSc programmes without a major concentration are not normally open to ROTP and RETP cadets. Cadets may only transfer into these programmes with special permission from the Dean of the Faculty.
4. The BMASc (Honours) and BMASc degrees are offered through the Division of Continuing Studies and are not open to ROTP or RETP cadets. For more information on the specific requirements of these degrees consult the Continuing Studies Calendar.

For ROTP and RETP cadets, the normal duration of the programme of studies at RMC is four years, no matter which degree is sought. However, permission may be granted for a student to repeat not more than one failed year, provided performance in all other areas is satisfactory.

All degree programmes are offered in English and in French. A student will normally register in academic courses given in the student's first official language. Students who have reached the functional level in their second language may register in courses in their second language and in courses taught in a bilingual format.

The College year is divided into two terms, the Fall Term and the Winter Term. The academic year normally extends from late August until May.

Core Curriculum

The Core Curriculum represents the minimum content in certain areas which are required content of all RMC degrees.

However, all students need not pass exactly the same pattern of courses in order to complete all core curriculum requirements.

The Core Curriculum contains within it two separate themes;

1. The first theme is the minimum standard for mathematics (which also includes logic and information technology) and sciences (chemistry and physics).
2. The second theme is the basic requirements in the Canadian history, language and culture, Politics, International relations and leadership and ethics.

The Physical Education programme is divided into three areas:

1. Intercollegiate sports,
2. Intramural sports, and
3. Physical Training.

All cadets must take part in both the Physical Training programme and one of the sports programmes.

Professional Military Training is required of all cadets in all four years.

First Year

First Year may be completed in either:

- Arts;
- Science; or
- Engineering.

Students who complete the First Year Science or Engineering Programme may proceed in Engineering or in Science in subsequent years.

They may also enter Second Year Arts but will be required to make up specific Arts courses from First Year.

Second Year

In Second Year, courses of study are available in Arts, Science, or Engineering. Details may be found in the Course Outlines section.

ARTS

The following fields of study in Arts are available, for both BA (Honours) and BA programmes:

- English
- French Studies
- History
- Politics
- Economics
- Military And Strategic Studies
- Business Administration

Students in the Arts will normally select a major in Second Year. The major will consist of a set of courses required by the programme, together with required Arts and Science Core Curriculum courses, and electives.

Students wishing to obtain an Honours degree in a major will be required to complete additional courses

and requirements as specified by the department of study. Application for entry into Honours programmes will be made to the department and will normally be done during Third Year (or at the beginning of Third Year in the case of Business Administration.)

In addition to the major, students may also develop a minor in one subject (History, English, French Studies, Politics and Economics, Business Administration, Military Strategic Studies or Military Psychology and Leadership) which is not an integral part of their major concentration. A minor concentration is also available in Military Psychology and Leadership.

SCIENCE

The Faculty of Science offers degrees at the general, minor, majors and honours levels in Chemistry, Computer Science, Mathematics, Physics and Space Science. The general regulations for each programme are given below and detailed descriptions can be found in the appropriate departmental calendar entry.

Honours

A BSc (Honours) degree is normally a four year degree programme and is offered in the following disciplines:

- Mathematics
- Computer Science
- Chemistry
- Physics
- Space Science
- a combination of two disciplines listed above.

A BSc (Honours) degree will be awarded if the following conditions are completed:

- The College Common Core Curriculum;
- The Science Programme for First Year;
- 33 credits in science including first year courses: in a single discipline as specified in the appropriate departmental regulations; (for a BSc(Honours) with a single major concentration); or
- 16 different credits from each of two disciplines as specified in appropriate departmental regulations (for a BSc (Honours) with a double major concentration) plus one science elective;
- Honours Thesis (or its equivalent) in one of the Honours disciplines

Note: The thesis will count as two semester courses.

Students entering an Honours programme require the permission of the appropriate department(s).

Normally a student must obtain a 65% average in the first year science courses to be eligible for entry into an honours or combined honours programme in second year.

A candidate must normally maintain a 70% average in the science courses in the Third and Fourth Years of the programme of study or may be required to withdraw from the BSc (Honours) programme and continue in a BSc programme with a major or combined major concentration.

With the permission of the Deans of Arts and Science, a combined honours BSc degree in:

- Chemistry and Psychology;
- Space Science and Military and Strategic Studies; or
- Computer Science and Business Administration

will be awarded if the combined honours requirements are met in the respective Science and Arts disciplines.

The honours programme has a total of 45 credits.

Majors

A BSc with a major concentration is normally a four-year programme and can be obtained in the following disciplines:

- Chemistry
- Computer Science
- Mathematics
- Physics
- Space Science

A BSc degree with a major concentration will be awarded upon successful completion of:

- the College Common Core Curriculum;
- the Science Programme for First Year; and
- 32 credits in science, including first year courses, as approved by the Dean of Science. 16 credits must be in the major concentration as specified by the major department.

Note: Departmental regulations should be consulted for details.

The Major programme has a total of 42 credits.

Combined Majors

With the permission of the Dean of Science, a candidate who successfully completes the 16 credit requirements in major programmes for two disciplines will be awarded a combined majors BSc.

Normally a candidate must obtain a 60% average in the first year science courses to be eligible for entry into a combined majors programme.

With the permission of the Deans of Science and Arts, combined majors programmes may be undertaken with the second majors concentration in the Faculty of Arts in the following combinations:

- Chemistry and Psychology;
- Space Science and Military; and Strategic Studies; or
- Computer Science and Business Administration.

The Arts portion of the degree will conform to the requirements of the Faculty of Arts.

Minors

A minor course of study in the Faculty of Science consists of 8 credits in the minor discipline as

specified by departmental regulations.

Candidates for a degree in science may undertake a minor in the Faculty of Science or in the Faculty of Arts with the permission of the appropriate Dean.

The Arts minor will conform to requirements specified by the Faculty of Arts.

General Science

A BSc degree without a major concentration will be awarded upon successful completion of:

1. the Core Curriculum as appropriate to method of enrollment.
2. the Science programme for first year;
3. 30 total credits of which 11 must be in science at the Second, Third or Fourth year level.

Course approval and the permission of the Dean of Science are required to enter this program.

Note: ROTP / RETP / UTPNCM candidates will follow the standard RMC undergraduate common core. All others will follow the common core as specified by the Division of Continuing Studies.

ENGINEERING

Students completing First Year Engineering may proceed in an engineering programme for which they have qualified.

An overall average of at least 55 percent is normally required for admission into any engineering degree programme. Students are required to choose a specific degree programme at the beginning of Second Year.

The available engineering programmes are:

- Chemical Engineering,
- Civil Engineering,
- Computer Engineering,
- Electrical Engineering,
- Mechanical Engineering, or
- Aeronautical Engineering.

Admission to an engineering programme requires the approval of the Head of the Department.

There is sufficient commonality in all programmes to allow students to change their specialization without the need to take additional courses up until the end of the first semester of second year.

Students wishing to change their specialization during the first semester will require the approval of the Heads of both affected departments. Students may also change their specialization at any time in the second term, but may be required to make up specific courses in order to satisfy the requirements of their chosen degree. Changes at this time will require the approval of the Dean of Engineering and the Heads of both departments.

Third And Fourth Year Arts

Arts students will continue in their major and minor programmes in Third and Fourth Year. Specified

course requirements from Second Year will complement the selected programme. Application to an Honours programme in the major in the second term of Third Year (or at the beginning of Third Year in the case of Business Administration.)

In addition to requirements of Second Language Training, Physical Education, and Professional Military Training, students will continue with their required courses for their major. The mandatory courses in Military Psychology and Leadership and other core curriculum requirements must also be satisfied.

The actual courses which will be taken in each of the Third and Fourth Year will be dependent upon specific degree requirements (i.e., whether the student has entered an Honours programme in their major -- see course outlines section) and timetable limitations

Third And Fourth Year Science

The concentration selected in the Second Year will normally be continued in the Third and Fourth Year.

The description and the requirements for each of these programmes can be found in the calendar regulations of the appropriate departments.

With the approval of the Dean of Engineering, students who complete Second Year of a science programme may be permitted to enter Third Year Engineering with some additional courses.

With the approval of the Dean of Science, students who complete Second Year Engineering may be permitted to enter any Third Year Science programme.

With the approval of the Dean of Science and on the recommendation of the Dean of Engineering, students in the Fourth Year of an engineering programme may be admitted to Science with a concentration in the appropriate engineering discipline. The approved courses will constitute the programme of study for the purposes of Academic Regulations.

Third And Fourth Year Engineering

A student admitted to a Third Year Engineering programme will normally remain in that programme in Fourth Year.

With the approval of the Dean of Engineering, exceptional students who complete Second Year of a science programme may be permitted to enter Third Year Engineering with some additional courses.

With the approval of the Dean of Science, exceptional students who complete Second Year Engineering may be permitted to enter any Third Year Science programme.

3 Year Degrees

See appropriate section under the Faculty of Arts, Faculty of Science, and Division of Continuing Studies.

Course Outline Tables

1st Year Arts

Table 1

		Fall Term				Winter Term				
		Periods/Week				Periods/Week				
	Credit	Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	Notes
ENE110: Introduction to Literary Studies and University Writing Skills	2	3	-	3	6	3	-	3	6	
HIE102: Canada	2	3	-	3	6	3	-	3	6	
PSE112: Introduction to Psychology	2	3	-	3	6	3	-	3	6	
ECE102: Elements of Economics	2	3	-	3	6	3	-	3	6	
POE106: Canadian Civics and Society	2	3	-	3	6	3	-	3	6	
MAE103A: Precalculus Mathematics	(1)	(3)	-	(3)	(6)	-	-	-	-	A
MAE106A: Discrete Mathematics with Probability	1	3	-	3	6	-	-	-	-	
MAE108B: Elements of Differential Calculus	1	-	-	-	-	3	1	4	4	
SLEFR1:	-	-	5	5	2	-	5	5	2	
ATH101:	-	-	2	2	-	-	2	2	-	
PMT 100 Series:	-	-	2	2	-	-	2	2	-	B
Total	12	18	9	27	38	18	10	28	36	

Notes:

A. Students who do not have high school leaving mathematics (OAC, Gr 12, or CEGEP 1) must also take MAE103A in the fall term.

B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

1st Year Science

Table 2

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
ENE100: Introduction to Literary Studies and University Writing Skills	2	3	-	3	6	3	-	3	6	
PSE123A: Fundamentals of Human Psychology	1	3	-	3	3	-	-	-	-	
MAE101: Introductory Calculus	2	3	1	4	4	3	1	4	4	
MAE129B: Introduction to Algebra	1	-	-	-	-	3	1	4	4	
CSE101A: Introduction to Algorithms and Computing	1	3	1	4	4	-	-	-	-	
PHE104: General Physics	2.5	3	3	6	6	3	3	6	6	
CCE101: Engineering Chemistry	2.5	3	2	5	5	3	2	5	5	
SLEFR1:	-	-	6	6	2	-	6	6	2	
ATH101:	-	-	2	2	-	-	2	2	-	
PMT 100 Series:	-	-	2	2	-	-	2	2	-	A
Total	12	18	17	35	30	15	17	32	27	

NOTE:

A. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

1st Year Engineering

Table 3

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
ENE100: Introduction to Literary Studies and University Writing Skills	2	3	-	3	6	3	-	3	6	
PSE123A: Fundamentals of Human Psychology	1	3	-	3	3	-	-	-	-	
MAE101: Introductory Calculus	2	3	1	4	4	3	1	4	4	
MAE119B: Linear Algebra for Engineers	1	-	-	-	-	3	1	4	4	
CSE101A: Introduction to Algorithms and Computing	1	3	1	4	4	-	-	-	-	
PHE104: General Physics	2.5	3	3	6	6	3	3	6	6	
CCE101: Engineering Chemistry	2.5	3	2	5	5	3	2	5	5	
GEE167B: Engineering Graphics - I	1	-	-	-	-	1	2	3	3	
SLEFR1:	-	-	6	6	2	-	6	6	2	
ATH101:	-	-	2	2	-	-	2	2	-	
PMT 100 Series:	-	-	2	2	-	-	2	2	-	A
Total	13	18	17	35	30	16	19	35	30	

NOTE:

A. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

2nd Year Arts

Table 4

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
ENE200: Cross-currents of Thought in 20-th Century Literature	2	3	-	3	6	3	-	3	6	
HIE202: Introduction to Canadian Military History	2	3	-	3	6	3	-	3	6	
MAE208A: Elements of integral Calculus and Linear Algebra	1	3	1	4	4	-	-	-	-	
Arts Electives: 4 term courses to be taken over Fall and Winter terms.	4	6	-	6	12	6	-	6	12	A,B,C
Science Core	1 (2)	(3)	-	(3)	(6)	3	-	3	6	D
SLEFR2:	-	-	5	5	2	-	5	5	2	
ATH201:	-	-	2	2	-	-	2	2	-	
PMT 200 Series:	-	-	2	2	-	-	2	2	-	E
Total	10 (11)	15	10	25	30	15	9	24	32	
NOTES: on Arts Electives										
A. No more than the equivalent of two full-year courses can be taken from the same department (not including core courses in English and History)										
B. Students wishing to obtain a minor should do so starting in Second Year. Minors are available in Psychology, English, French, History, Politics or Economics. Consult the Department responsible for the Minor for more details.										
C. For details on individual programmes and course descriptions see the entries under the respective Departments. Student should consult the yearly listing of courses offered provided by the Registrar's Office. Students wishing to obtain a minor must include course selections in this count and obtain the Department Head's approval for the minor. Extra courses are permitted but require the approval of the Dean of Arts.										
NOTE: on Science Core										
D. See Table 6 concerning Science Core requirements. A list of courses offered is available from the Registrar's Office.										
NOTE: other										
E. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.										

2nd Year Business Administration

Table 5

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
ENE200: Cross-currents of Thought in 20-th Century Literature	2	3	-	3	6	3	-	3	6	
HIE203B: Canadian Military History	1	-	-	-	-	3	-	3	6	
MAE208A: Elements of integral Calculus and Linear Algebra	1	3	1	4	4	-	-	-	-	
BAE202A: Financial Accounting I	1	3	-	3	6	-	-	-	-	
BAE208B: Management Accounting	1	-	-	-	-	3	-	3	6	
BAE220B: Introduction to Information Technology	1	-	-	-	-	3	-	3	6	
BAE242A: Quantitative Methods I	1	3	-	3	6	-	-	-	-	
ECE206A: Macroeconomic Theory and Policy I (Honours only)	1	3	-	3	6	-	-	-	-	A
ECE224A: Microeconomics I	1	3	-	3	6	-	-	-	-	
Elective (Arts or Science)	1	-	-	-	-	3	-	3	6	B
Science Core	1 (2)	(3)	-	(3)	(6)	3	-	3	6	C
SLEFR2	-	-	5	5	2	-	5	5	2	
ATH201:	-	-	2	2	-	-	2	2	-	
PMT 200 Series:	-	-	2	2	-	-	2	2	-	D
Total Honours:	12 (13)	18	10	28	36	18	9	27	38	
Total Major:	11 (12)	15	10	25	30	18	9	27	38	

NOTES:

A. Required for Honours; recommended for Major.

B. A list of courses for the major and electives can be obtained from the Registrar's Office. The list includes courses for minors.

C. See [Table 6](#) concerning Science Core requirements. These courses can be taken in either Fall or Winter term. A list of courses offered is available from the Registrar's Office.

D. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

Science Requirements for Arts and Business Administration

Table 6

Subjects completed at High School Leaving Level	Required Science Courses	Total Science Core credits required	Total Science Core credits required (Bus Admin only)
Without Chemistry	MAE100 (or MAE108B + MAE208A) + MAE106A/B + CCE106A + (1 Chemistry and 1 Physics) at the 200-300 level + 1 Information Technology Course	7	6 (no IT)
Without Physics	MAE100 (or MAE108B + MAE208A) + MAE106A/B + PHE202B + (1 Chemistry and 1 Physics) at the 200-300 level + 1 Information Technology Course	7	6 (no IT)
Without Mathematics	MAE103A + MAE100 (or MAE108B + MAE208A) + MAE106A/B + (1 Chemistry and 1 Physics) at the 200-300 level + 1 Information Technology Course	7	6 (no IT)
Without Chemistry and Physics	MAE100 (or MAE108B + MAE208A) + MAE106A/B + CCE106A + PHE202B + (1 Chemistry and 1 Physics) at the 200-300 level + 1 Information Technology Course	8	7 (no IT)
Without Chemistry and Mathematics	MAE103A + MAE100 (or MAE108B + MAE208A) + MAE106A/B + CCE106A + (1 Chemistry and 1 Physics) at the 200-300 level + 1 Information Technology Course	8	7 (no IT)
Without Physics and Mathematics	MAE103A + MAE100 (or MAE108B + MAE208A) + MAE106A/B + PHE202B + (1 Chemistry and 1 Physics) at the 200-300 level + 1 Information Technology Course	8	7 (no IT)
Without Chemistry, Physics and Mathematics	MAE103A + MAE100 (or MAE108B + MAE208A) + MAE106A/B + CCE106A + PHE202B + (1 Chemistry and 1 Physics) at the 200-300 level + 1 Information Technology Course	9	8 (no IT)
Chemistry, Physics and Mathematics completed	MAE100 (or MAE108B + MAE208A) + MAE106A/B + (1 Chemistry and 1 Physics) at the 200-300 level + 1 Information Technology Course + other Science Elective	7	5 (no IT or other Science Elective)

COMMENTS:

1. Students who entered 1st year in 2002-2003 should take courses in the following order:

	First Year: MAE100 + MAE106B or if required MAE103A + MAE106B + one other science core course
	Second Year: two science core courses or CCE106A + PHE202B if required + MAE100 (if not taken in first year)
	Third and Fourth Year: all remaining science core requirements, should be spread evenly over the two years.

2. Students entering 1st year in 2003-2004 will take MAE108B in first year and MAE208A in second year (instead of MAE100), and should take courses in the following order:

	First Year: MAE106A + MAE108B or MAE103A + MAE106A + MAE108B
	Second Year: MAE 208A + two science core courses or CCE106A + PHE202B if required
	Third and Fourth Year: all remaining science core requirements, should be spread evenly over the two years.

3. For Business Administration the course BAE220B (or BAE208A or BAE304A and BAE410A combined) satisfies the Information Technology (IT) core curriculum requirement, and BAE242A counts as a Science Elective.

2nd Year Science

Table 7

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
HIE203B: Canadian Military History	1	-	-	-	-	3	-	3	3	
HIE207A: Canada	1	3	-	3	3	-	-	-	-	
POE205B: Canadian Civics and Society	1	-	-	-	-	3	-	3	3	
Science Courses: These numbers are approximations. For details on individual programmes (Honours, Double Major, Major, and Minor) and course descriptions see the entries under the respective Departments.	8 (7)	10 (+)	(?)	10 (+)	10 (+)	10	(?)	10	10	A
SLEFR2	-	-	5	5	2	-	5	5	2	
ATH201:	-	-	2	2	-	-	2	2	-	
PMT 200 Series:	-	-	2	2	-	-	2	2	-	B
Total	11 (12)	15 (+)	10 (+)	25 (+)	18 (+)	18	10 (+)	28	21	

NOTES:

A. Students should consult the yearly listing of courses offered provided by the Registrar's Office. Students wishing to obtain a minor must obtain the Department Head's approval for the minor. Extra courses are permitted but require the approval of the Dean of Science.

B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

2nd Year Chemical Engineering

Table 8 (Academic Year 2006-2007 only - changes anticipated for 2007-2008)

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
HIE203B: Canadian Military History	1	-	-	-	-	3	-	3	3	
HIE207A: Canada	1	3	-	3	3	-	-	-	-	
POE205B: Canadian Civics and Society	1	-	-	-	-	3	-	3	3	
MAE226A: Engineering Calculus	1.5	4	1	4	4	3	1	4	4	
MAE227B: Ordinary Differential Equations, Sequences and Series for Engineers	1	-	-	-	-	3	1	4	4	
MAE209B: Probability & Statistics	1		-	-	-	3	-	3	4	
PHE207A: Electricity and Magnetism	1	3	1	4	4	-	-	-	-	
Expt. Physics	-	-	3	3	3	-	-	-	-	A
CCE220A: Introduction to Materials Science and Engineering Materials	1	3	-	3	3	-	-	-	-	
CCE240B: Introduction to Biological Sciences	1	-	-	-	-	3	-	3	3	
CCE241: Organic Chemistry	2	3	2	5	5	3	2	5	5	
GEE231B: Introduction to Mechanics of Materials	1	-	-	-	-	2	2	4	4	
GEE265A: Engineering Graphics - 1	1	1	2	3	3	-	-	-	-	
GEE283A: Engineering Economics	0.5	2	-	2	4	-	-	-	-	
SLEFR2:	-	-	5	5	2	-	5	5	2	
ATH201:	-	-	2	2	-	-	2	2	-	
PMT 200 Series:	-	-	2	2	-	-	2	2	-	B
Total	14	19	18	36	31	20	14	34	28	

NOTES:

A. Standing in Experimental Physics will be weighted equally into Physics lecture courses.

B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

2nd Year Civil Engineering

Table 9 (Academic Year 2006-2007 only - changes anticipated for 2007-2008)

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
HIE203B: Canadian Military History	1	-	-	-	-	3	-	3	3	
HIE207A: Canada	1	3	-	3	3	-	-	-	-	
POE205B: Canadian Civics and Society	1	-	-	-	-	3	-	3	3	
MAE222A: Intermediate Calculus	(1.5)	(4)	(1)	(4)	(4)	-	-	-	-	A
MAE227B: Ordinary Differential Equations, Sequences and Series for Engineers	1	-	-	-	-	3	1	4	4	
MAE209B: Probability & Statistics	1	-	-	-	-	3	-	3	4	
MAE229A: Linear Algebra	1	3	1	4	4	-	-	-	-	
PHE205A: Mechanics	1	3	1	4	4	-	-	-	-	
Expt. Physics	-	-	3	3	3	-	-	-	-	A
CCE220A: Introduction to Materials Science and Engineering Materials	1	3	-	3	3	-	-	-	-	
GEE231B: Introduction to Mechanics of Materials	1	-	-	-	-	2	2	4	4	
GEE235B: Introduction to Earth Sciences	1	-	-	-	-	3	2	5	5	
GEE265A: Engineering Graphics - I	1	1	2	3	3	-	-	-	-	
GEE267B: Engineering Graphics - II	1	-	-	-	-	1	2	3	3	
GEE283A: Engineering Economics	0.5	2	-	2	4	-	-	-	-	
SLEFR2:	-	-	5	5	2	-	5	5	2	
ATH201:	-	-	2	2	-	-	2	2	-	
PMT 200 Series:	-	-	2	2	-	-	2	2	-	B
Total	11.5	15	17	35	30	18	16	34	28	

NOTES:

A. Standing in Experimental Physics will be weighted equally into Physics lecture courses.

B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

2nd Year Electrical and Computer Engineering

Table 10 (Academic Year 2006-2007 only - changes anticipated for 2007-2008)

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
HIE203B: Canadian Military History	1	-	-	-	-	3	-	3	3	
HIE207A: Canada	1	3	-	3	3	-	-	-	-	
POE205B: Canadian Civics and Society	1	-	-	-	-	3	-	3	3	
MAE226A: Engineering Calculus	1.5	4	1	4	4	-	-	-	-	
MAE227B: Ordinary Differential Equations, Sequences and Series for Engineers	1	-	-	-	-	3	1	4	4	
MAE209B: Probability & Statistics	1	-	-	-	-	3	-	3	4	
MAE229A: Linear Algebra	1	3	1	4	4	-	-	-	-	
PHE228B: Electromagnetism	1	-	-	-	-	3	2	5	3	
CCE220A: Introduction to Materials Science and Engineering Materials	1	3	-	3	3	-	-	-	-	
EEE203B: Electric Circuits I	1	-	-	-	-	3	2	5	5	
EEE243B: Applied Computer Programming	1	-	-	-	-	3	2	4	5	
EEE245A: Logic Design	1	3	2	5	5	-	-	-	-	
GEE265A: Engineering Graphics - I	1	1	2	3	3	-	-	-	-	
GEE283A: Engineering Economics	0.5	2	-	2	4	-	-	-	-	
SLEFR2:	-	-	5	5	2	-	5	5	2	
ATH201:	-	-	2	2	-	-	2	2	-	
PMT 200 Series:	-	-	2	2	-	-	2	2	-	A
Total	11.5	15	15	33	28	21	16	36	29	

NOTES:

A. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

2nd Year Electrical and Computer Engineering

Table 10 (Academic Year 2006-2007 only - changes anticipated for 2007-2008)

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
HIE203B: Canadian Military History	1	-	-	-	-	3	-	3	3	
HIE207A: Canada	1	3	-	3	3	-	-	-	-	
POE205B: Canadian Civics and Society	1	-	-	-	-	3	-	3	3	
MAE226A: Engineering Calculus	1.5	4	1	4	4	-	-	-	-	
MAE227B: Ordinary Differential Equations, Sequences and Series for Engineers	1	-	-	-	-	3	1	4	4	
MAE209B: Probability & Statistics	1	-	-	-	-	3	-	3	4	
MAE229A: Linear Algebra	1	3	1	4	4	-	-	-	-	
PHE228B: Electromagnetism	1	-	-	-	-	3	2	5	3	
CCE220A: Introduction to Materials Science and Engineering Materials	1	3	-	3	3	-	-	-	-	
EEE203B: Electric Circuits I	1	-	-	-	-	3	2	5	5	
EEE243B: Applied Computer Programming	1	-	-	-	-	3	2	4	5	
EEE245A: Logic Design	1	3	2	5	5	-	-	-	-	
GEE265A: Engineering Graphics - I	1	1	2	3	3	-	-	-	-	
GEE283A: Engineering Economics	0.5	2	-	2	4	-	-	-	-	
SLEFR2:	-	-	5	5	2	-	5	5	2	
ATH201:	-	-	2	2	-	-	2	2	-	
PMT 200 Series:	-	-	2	2	-	-	2	2	-	A
Total	11.5	15	15	33	28	21	16	36	29	

NOTES:

A. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

2nd Year Mechanical and Aeronautical Engineering

Table 11 (Academic Year 2006-2007 only - changes anticipated for 2007-2008)

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
HIE203B: Canadian Military History	1	-	-	-	-	3	-	3	3	
HIE207A: Canada	1	3	-	3	3	-	-	-	-	
POE205B: Canadian Civics and Society	1	-	-	-	-	3	-	3	3	
MAE226A: Engineering Calculus	1.5	4	1	4	4	-	-	-	-	
MAE227B: Ordinary Differential Equations, Sequences and Series for Engineers	1	-	-	-	-	3	1	4	4	
MAE209B: Probability & Statistics	1	-	-	-	-	3	-	3	4	
MAE229A: Linear Algebra	1	3	1	4	4	-	-	-	-	
PHE205A: Mechanics	1	3	1	4	4	-	-	-	-	
Experimental Physics	-	-	3	3	3	-	-	-	-	A
CCE220A: Introduction to Materials Science and Engineering Materials	1	3	-	3	3	-	-	-	-	
GEE231B: Introduction to Mechanics of Materials	1	-	-	-	-	2	2	4	4	
GEE241B: Electrical Technology	1	-	-	-	-	3	2	5	5	
GEE265A: Engineering Graphics - I	1	1	2	3	3	-	-	-	-	
GEE267B: Engineering Graphics - II	1	-	-	-	-	1	2	3	3	
GEE283A: Engineering Economics	0.5	2	-	2	4	-	-	-	-	
SLEFR2:	-	-	5	5	2	-	5	5	2	
ATH201:	-	-	2	2	-	-	2	2	-	
PMT 200 Series:	-	-	2	2	-	-	2	2	-	B
Total	11.5	15	17	35	30	18	16	34	28	

NOTES:

A. Standing in Experimental Physics will be weighted equally into Physics lecture courses.

B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

3rd Year Arts

Table 12

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE301A: Organizational Behaviour & Leadership	1	3	-	3	3	-	-	-	-	
HIE271A: Introduction to Military History and Thought	1	3	-	3	6	-	-	-	-	A
Arts Electives: 6 term courses to be taken over Fall and Winter Terms.	6	9	-	9	18	9	-	9	18	B
Science Core	2	3	-	3	6	3	-	3	6	C
SLEFR3:	-	-	5	5	2	-	5	5	2	
ATH301:	-	-	2	2	-	-	2	2	-	
PMT 300 Series:	-	-	2	2	-	-	2	2	-	D
Total	10	18	9	27	35	12	9	21	26	
NOTES:										
A. All students in 3rd year must take HIE271A. However, students in History or in Military and Strategic Studies must take HIE270 in its place.										
B. For details on individual programmes and course descriptions see the entries under the respective departments. Student should consult the yearly listing of courses offered provided by the Registrar's Office. Students wishing to obtain a minor must include course selections in this count and obtain the Department Head's approval for the minor. Extra courses are permitted but require the approval of the Dean of Arts.										
C. See Table 6 concerning Science Core requirements. These courses can be taken in either Fall or Winter term. A list of courses offered is available from the Registrar's Office.										
D. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.										

3rd Year Business Administration

Table 13

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE301A: Organizational Behaviour & Leadership	1	3	-	3	3	-	-	-	-	
HIE271A: Introduction to Military History and Thought	1	3	-	3	6	-	-	-	-	
BAE300B: Finance	1	-	-	-	-	3	-	3	6	
BAE302B: Financial Accounting II	1	-	-	-	-	3	-	3	6	
BAE314A: Marketing Fundamentals	1	3	-	3	6	-	-	-	-	
BAE316B: Intermediate Marketing	1	-	-	-	-	3	-	3	6	
BAE326B: Human Resources Management	1	-	-	-	-	3	-	3	6	
BAE342A: Quantitative Methods II	1	3	-	3	6	-	-	-	-	
BAE344B: Operations Management	1	-	-	-	-	3	-	3	6	
Elective (Arts or Science)	1	-	-	-	-	3	-	3	6	A
Science Core	1	-	-	-	-	3	-	3	6	B
SLEFR3:	-		5	5	2	-	5	5	2	
ATH301:	-	-	2	2	-	-	2	2	-	
PMT 300 Series:	-	-	2	2	-	-	2	2	-	C
Total	11	12	9	21	23	21	9	30	44	

NOTES:

A. A list of courses for the major and electives can be obtained from the Registrar's Office. The list includes courses for minors.

B. See [Table 6](#) concerning Science Core requirements. These courses can be taken in either Fall or Winter term. A list of courses offered is available from the Registrar's Office.

C. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

3rd Year Science

Table 14

		CREDIT	Fall Term				Winter Term				NOTES
			Periods/Week				Periods/Week				
			Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE301A: Organizational Behaviour & Leadership		1	3	-	3	3	-	-	-	-	
HIE271B: Introduction to Military History and Thought		1	-	-	-	-	3	-	3	6	
Science Courses: These numbers are approximations. For details on individual programmes (Honours, Double Major, Major, and Minor) and course descriptions see the entries under the respective Departments.	Honours:	9 (10)	15	(?)	15	15	12 (+)	(?)	12 (+)	12 (+)	A
	Double Major:	9	15	(?)	15	15	12	(?)	12	12	A
	Major:	8 (9)	12 (+)	(?)	12 (+)	12 (+)	12	(?)	12	12	A
SLEFR3			-	4	4	2	-	4	4	2	
ATH301:			-	2	2	-	-	2	2	-	
PMT 300 Series:		-	-	2	2	-	-	2	2	-	B
Total	Honours:	11 (12)	18	8 (+)	26	20	15 (+)	8 (+)	23 (+)	17 (+)	
	Double Major:	11	18	8 (+)	26	20	15	8 (+)	23	17	
	Major:	10 (11)	15 (+)	8 (+)	23 (+)	17 (+)	15	8 (+)	23	17	
NOTES:											
A. Students should consult the yearly listing of courses offered provided by the Registrar's Office. Students wishing to obtain a minor must obtain the Department Head's approval for the minor. Extra courses are permitted but require the approval of the Dean of Science.											
B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.											

3rd Year Chemical Engineering

Table 15 (Academic Year 2006-2007 only - changes anticipated for 2007-2008)

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE301A: Organizational Behaviour & Leadership	1	3	-	3	3	-	-	-	-	
HIE271B: Introduction to Military History and Thought	1	-	-	-	-	3	-	3	6	
MAE315A: Applied Mathematics for Chemical and Materials Engineers	1	3	-	3	3	-	-	-	-	
CCE300B: Fluid Mechanics	1	-	-	-	-	3	-	3	3	
CCE303A: Energy and Fuels Engineering	1	3	-	3	3	-	-	-	-	
CCE305B: Heat Transfer	1	-	-	-	-	3	-	3	3	
CCE312A: Applied Thermodynamics I	1	3	-	3	3	-	-	-	-	
CCE313B: Applied Thermodynamics II	1	-	-	-	-	3	-	3	3	
CCE315B Chemical and Materials Engineering Computations	1	-	-	-	-	3	-	3	3	
CCE317B: Kinetics and Surface Science	1	-	-	-	-	3	-	3	3	
CCE321: Engineering Laboratory	1	-	3	3	3	-	4	4	4	
CCE337B: Seminar	-	-	-	-	-	-	0.5	0.5	-	
CCE345A: Materials Science: Metallurgical Laboratory	0.5	-	3	3	3	-	-	-	-	
CCE351A: Nuclear Science	1	3	-	3	3	-	-	-	-	
CCE353A: Materials Science: Metallurgy	1	3	-	3	3	-	-	-	-	
CCE363B: Chemical Engineering Applied to Nuclear- Biological-Chemical Defence	1	-	-	-	-	3	-	3	3	A
CCE365B: Environmental Engineering	(1)	-	-	-	-	(3)	-	(3)	(3)	A
CCE385A: Biotechnology	1	3	-	3	3	-	-	-	-	
MEE321B: Heat Engines Laboratory	-	-	-	-	-	-	(2)	(2)	(2)	B
SLEFR3:	-	-	4	4	2	-	4	4	2	
ATH301:	-	-	2	2	-	-	2	2	-	
PMT 300 Series:	-	-	2	2	-	-	2	2	-	C
Total	15.5	21	14	35	29	21	12.5	33.5	30	

NOTES:

A. Students can choose either CCE363B or CCE365B.

B. MEE321B is part of CCE321 part II. Marks will be combined and reported in CCE321.

C. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

3rd Year Civil Engineering

Table 16

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE301A: Organizational Behaviour & Leadership	1	3	-	3	3	-	-	-	-	

CEE303A: Strength of Materials	1	3	2	5	5	-	-	-	-	
CEE305B: Structural Theory	1	-	-	-	-	3	2	5	5	
CEE311B: Engineering Materials and Introduction to Steel and Timber Design	1	-	-	-	-	3	2	5	5	
CEE317A: Civil Engineering Analysis I	1	2	2	4	4	-	-	-	-	
CEE319B: Civil Engineering Analysis II	0.5	-	-	-	-	2	1	3	3	
CEE343A: Hydrology	1	2	1	3	3	-	-	-	-	
CEE355A: Soil Mechanics	1	3	2	5	5	-	-	-	-	
CEE360A: Geomatics I	1	2	2	4	4	-	-	-	-	
CEE362B: Geomatics II	1	-	-	-	-	2	2	4	4	
CEE363B: Survey Field School*	1	-	-	-	-	-	-	-	-	
CEE385A: Introduction to Environmental Engineering	1	3	1	4	4	-	-	-	-	
CEE387B: Highway Design	1	-	-	-	-	3	2	5	5	
MEE315B: Fluid Mechanics	1	-	-	-	-	3	2	5	5	
SLEFR3:		-	4	4	2	-	4	4	2	
ATH301:	-	-	2	2	-	-	2	2	-	
PMT 300 Series:	-	-	2	2	-	-	2	2	-	A
Total	13.5	18	18	36	30	16	19	35	29	

NOTES:

* The duration of the Winter Term is 12 weeks followed by a two week examination period. The two-week survey field school is held immediately after the examinations.

A. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

3rd Year Computer Engineering

Table 17

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE301A: Organizational Behaviour & Leadership	1	3	-	3	3	-	-	-	-	
HIE271B: Introduction to Military History and Thought	1	-	-	-	-	3	-	3	6	
MAE232B: Topics in Discrete Mathematics	1	-	-	-	-	3	1	4	4	
MAE305(1): Differential Equations, Boundary Value Problems and Complex Variables - part 1	1	3	1	4	4	-	-	-	-	
CSE365A: Computer Program Design	1	3	2	5	5	-	-	-	-	
EEE303A: Electric Circuits II	1	3	2	5	5	-	-	-	-	
EEE307B: Computer Interfacing Techniques	1	-	-	-	-	3	2	5	5	
EEE309B: Control Systems I	1	-	-	-	-	3	2	5	5	A
EEE311B: Signals and Systems	(1)	-	-	-	-	(3)	(2)	(5)	(5)	B
EEE321B: Object-Oriented Techniques	1	-	-	-	-	3	2	5	5	
EEE341B: Electronic Devices and Circuits	1	-	-	-	-	3	2	5	5	
EEE351A: Computer Organization and Assembly Language	1	3	2	5	5	-	-	-	-	
EEE361A: Digital Design and HDL Modelling	1	3	2	5	5	-	-	-	-	
SLEFR3:	-	-	4	4	2	-	4	4	2	
ATH301:	-	-	2	2	-	-	2	2	-	
PMT 300 Series:	-	-	2	2	-	-	2	2	-	C
Total	12	18	17	35	29	18	17	35	32	

NOTES:

A. Students selecting Software option must take course marked 'A'

B. Students selecting Hardware option must take course marked 'B'

C. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

3rd Year Electrical Engineering

Table 18

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE301A: Organizational Behaviour & Leadership	1	3	-	3	3	-	-	-	-	
HIE271B: Introduction to Military History and Thought	1	-	-	-	-	3	-	3	6	
MAE305: Differential Equations, Boundary Value Problems and Complex Variables	2	3	1	4	4	3	1	4	4	
EEE301A: Applied Electromagnetics	1	3	2	5	5	-	-	-	-	
EEE303A: Electric Circuits II	1	3	2	5	5	-	-	-	-	
EEE307B: Computer Interfacing Techniques	1	-	-	-	-	3	2	5	5	
EEE309B: Control Systems I	1	-	-	-	-	3	2	5	5	
EEE311B: Signals and Systems	1	-	-	-	-	3	2	5	5	
EEE331A: Energy Conversion	1	3	2	5	5	-	-	-	-	
EEE341B: Electronic Devices and Circuits	1	-	-	-	-	3	2	5	5	
EEE351A: Computer Organization and Assembly Language	1	3	2	5	5	-	-	-	-	
SLEFR3:		-	4	4	2	-	4	4	2	
ATH301:	-	-	2	2	-	-	2	2	-	
PMT 300 Series:	-	-	2	2	-	-	2	2	-	A
Total	12	18	17	35	29	18	17	35	32	
NOTES:										
A. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.										

3rd Year Mechanical Engineering

Table 19

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE301A: Organizational Behaviour & Leadership	1	3	-	3	3	-	-	-	-	
HIE271B: Introduction to Military History and Thought	1	-	-	-	-	3	-	3	6	
MAE327: Differential Equations, Boundary Value Problems and Complex Variables	1.5	2	0.5	2.5	2.5	2	0.5	2.5	2.5	
MEE301B: Machine Design	1	-	-	-	-	3	1.5	4.5	4.5	
MEE303B: Engineering Design	1	-	-	-	-	3	1.5	4.5	4.5	
MEE311B: Fluid Mechanics - I	1	-	-	-	-	3	1.5	4.5	4.5	
MEE331A: Strength of Materials	1	3	1.5	4.5	4.5	-	-	-	-	
MEE333A: Metallurgy and Engineering Materials	1	3	1.5	4.5	4.5	-	-	-	-	
MEE335A: Introduction to Manufacturing Processes	0.5	1	2	3	3	-	-	-	-	
MEE345A: Applied Mechanics	1	3	1.5	4.5	4.5					
MEE351A: Thermodynamics I	1	3	1.5	4.5	4.5	-	-	-	-	
MEE353B: Thermodynamics II	1	-	-	-	-	3	1.5	4.5	4.5	
MEE383B: Measurement Devices and Systems	1	-	-	-	-	3	1.5	4.5	4.5	
SLEFR3:		-	4	4	2	-	4	4	2	
ATH301:	-	-	2	2	-	-	2	2	-	
PMT 300 Series:	-	-	2	2	-	-	2	2	-	A
Total	13	18	16.5	34.5	28.5	20	16	36	33	

NOTE:

A. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

3rd Year Aeronautical Engineering

Table 20 (offered as of Academic Year 2007-2008)

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE301A: Organizational Behaviour & Leadership	1	3	-	3	3	-	-	-	-	
HIE271B: Introduction to Military History and Thought	1	-	-	-	-	3	-	3	6	
MAE327: Differential Equations, Boundary Value Problems and Complex Variables	1.5	2	0.5	2.5	2.5	2	0.5	2.5	2.5	
MEE301B: Machine Design	1	-	-	-	-	3	1.5	4.5	4.5	
MEE303B: Engineering Design	1	-	-	-	-	3	1.5	4.5	4.5	
MEE311B: Fluid Mechanics - I	1	-	-	-	-	3	1.5	4.5	4.5	
MEE331A: Strength of Materials	1	3	1.5	4.5	4.5	-	-	-	-	
MEE333A: Metallurgy and Engineering Materials	1	3	1.5	4.5	4.5	-	-	-	-	
MEE335A: Introduction to Manufacturing Processes	0.5	1	2	3	3	-	-	-	-	
MEE345A: Applied Mechanics	1	3	1.5	4.5	4.5					
MEE351A: Thermodynamics I	1	3	1.5	4.5	4.5	-	-	-	-	
MEE353B: Thermodynamics II	1	-	-	-	-	3	1.5	4.5	4.5	
MEE383B: Measurement Devices and Systems	1	-	-	-	-	3	1.5	4.5	4.5	
SLEFR3:		-	4	4	2	-	4	4	2	
ATH301:	-	-	2	2	-	-	2	2	-	
PMT 300 Series:	-	-	2	2	-	-	2	2	-	A
Total	13	18	16.5	34.5	28.5	20	16	36	33	

NOTE:

A. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

4th Year Arts

Table 21

		CREDIT	Fall Term				Winter Term				NOTES
			Periods/Week				Periods/Week				
			Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE401B: Military Professionalism & Ethics		1	-	-	-	-	3	-	3	6	
POE316A: Introduction to International Relations		1	3	-	3	6	-	-	-	-	A
Arts Electives: courses to be taken over Fall and Winter Terms.	Honours:	7	9	-	9	18	12	-	12	24	B
	Major:	5	6	-	6	12	9	-	9	18	B
Science Core		1 (2)	3	-	3	6	(3)	-	(3)	(6)	C
SLEFR4			-	5	5	2	-	5	5	2	
ATH401:			-	2	2	-	-	2	2	-	
PMT 400 Series:		-	-	2	2	-	-	2	2	-	D
Total	Honours:	10 (11)	15	9	24	32	15	9	24	32	
	Major:	8 (9)	12	9	21	26	12	9	21	26	
NOTES :											
A. All students in 4th year must take POE316A. However, students who have already taken the course must replace it with another elective.											
B. For details on individual programme requirements and course descriptions see the entries under the respective Departments. Students should consult the yearly listing of courses offered provide by the Registrar's Office. Students wishing to obtain a minor must include course selections in this count and obtain the Department Head's approval for the minor. Extra courses are permitted but require the approval of the Dean of Arts.											
C. See Table 6 concerning Science Core requirements. These courses can be taken in either Fall or Winter term. A list of courses offered is available from the Registrar's Office.											
D. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.											

4th Year Business Administration

Table 22

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE401B: Military Professionalism & Ethics	1	-	-	-	-	3	-	3	6	
POE316A: Introduction to International Relations	1	3	-	3	6	-	-	-	-	
BAE410A: Information Systems	1	3	-	3	6	-	-	-	-	
BAE420B: Business Law	1	-	-	-	-	3	-	3	6	
BAE426B: Labour Relations	1	-	-	-	-	3	-	3	6	A
BAE432A: Organizational Theory	1	3	-	3	6	-	-	-	-	
BAE440A: International Management (Honours only)	1	3	-	3	6	-	-	-	-	B
BAE450B: Advanced Topics in Management	1	-	-	-	-	3	-	3	6	A, B
BAE452: Business Policy	2	3	-	3	6	3	-	3	6	
Elective (Arts or Science)	2	3	-	3	6	3	-	3	6	C
Science Core	(1)	(3)	-	(3)	(3)	-	-	-	-	D
SLEFR4	-	-	5	5	2	-	5	5	2	
ATH401:	-	-	2	2	-	-	2	2	-	
PMT 400 Series:	-	-	2	2	-	-	2	2	-	E
Total Honours:	10	18	9	27	38	18	9	27	38	
Total Major:	9	12	9	21	26	15	9	24	32	

NOTES:

A. Students will have the option of taking either BAE450B or BAE426B

B. Students with an average of at least A- in 3rd year Business Administration courses may substitute BAE490 Thesis in place of BAE 450B and BAE 440B - with permission of the Department.

C. A list of courses for the major and electives can be obtained from the Registrar's Office. The list includes courses for minors.

D. See [Table 6](#) concerning Science Core requirements. These courses can be taken in either Fall or Winter term. A list of courses offered is available from the Registrar's Office.

E. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

4th Year Science

Table 23

		CREDIT	Fall Term				Winter Term				NOTES
			Periods/Week				Periods/Week				
			Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE401B: Military Professionalism & Ethics		1	-	-	-	-	3	-	3	6	
POE316A: Introduction to International Relations		1	3	-	3	6	-	-	-	-	
Science Courses: These numbers are approximations. For details on individual programmes (Honours, Double Major, Major, and Minor) and course descriptions see the entries under the respective Departments.	Honours:	8 (9)	12 (+)	(?)	12 (+)	12 (+)	12	(?)	12	12	A
	Double Major:	9	15	(?)	15	15	12	(?)	12	12	A
	Major:	6-8	9 (+)	(?)	9 (+)	9 (+)	9 (+)	(?)	9 (+)	9 (+)	A
SLEFR4			-	5	5	2	-	5	5	2	
ATH401:			-	2	2	-	-	2	2	-	
PMT 400 Series:		-	-	2	2	-	-	2	2	-	B
Total	Honours:	9 (10)	12 (+)	9 (+)	21 (+)	14 (+)	15	9 (+)	24	20	
	Double Major:	10	15	9 (+)	24	17	15	9 (+)	24	20	
	Major:	7-9	9 (+)	9 (+)	18 (+)	11 (+)	12 (+)	9 (+)	21(+)	17 (+)	
NOTES:											
A. Students should consult the yearly listing of courses offered provided by the Registrar's Office. Students wishing to obtain a minor must obtain the Department Head's approval for the minor. Extra courses are permitted but require the approval of the Dean of Science.											
B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.											

4th Year Chemical Engineering

Table 24 (Academic Year 2006-2007 only - changes anticipated for 2007-2008)

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE401B: Military Professionalism & Ethics	1	-	-	-	-	3	-	3	6	
HIE289A: The Impact of Science and Technology on Society and the Environment	0.5	2	-	2	4	-	-	-	-	
CCE401: Nuclear Science and Engineering	1	3	-	3	3	3	-	3	3	
CCE405A: Mass Transfer Operations	1	2	-	2	2	2	-	2	2	
CCE407B: Reaction Engineering	1	3	-	3	3	-	-	-	-	
CCE409B: Combustion and Explosives Engineering	1	-	-	-	-	3	-	3	3	A
CCE413B: Systems Analysis: Modelling and Optimization	1	-	-	-	-	3	-	3	3	
CCE415A: Control Systems and Instrumentation	1	3	-	3	3	-	-	-	-	
CCE417: Design Project	1.5	-	3	3	3	-	3	3	3	
CCE421: Engineering Laboratory	1	-	3	3	3	-	3	3	3	
CCE425: Materials Engineering: Polymers and Material Selection	1.5	3	-	3	3	1	1	2	2	
CCE427: Corrosion and Electrochemical Power Sources	1.5	3	-	3	3	2	-	2	2	
CCE437B: Seminar	0	-	-	-	-	-	0.5	0.5	-	
CCE441A: Materials Engineering Laboratory	0.5	1	3	4	5	-	-	-	-	
CCE485B: Waste Treatment Processes	(1)	-	-	-	-	(3)	-	(3)	(3)	A
SLEFR4:	-	-	5	5	2	-	5	5	2	
ATH401:	-	-	2	2	-	-	2	2	-	
PMT 400 Series:	-	-	2	2	-	-	2	2	-	B
Total	13.5	20	18	38	34	17	17	34	29	

NOTES:

A. Students can choose either CCE409B or CCE485B.

B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

4th Year Civil Engineering

Table 25

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE401B: Military Professionalism & Ethics	1	-	-	-	-	3	-	3	6	
HIE271B: Introduction to Military History and Thought	1	-	-	-	-	3	-	3	6	
HIE289A: The Impact of Science and Technology on Society and the Environment	0.5	2	-	2	4	-	-	-	-	
CEE403A: Introduction to concrete and Reinforced Concrete Design	1	2	2	4	4	-	-	-	-	
CEE405A: Structural Analysis	1	3	2	5	5	-	-	-	-	
CEE415B: Reinforced Concrete Design	1	-	-	-	-	3	2	5	5	
CEE417A: Steel Design	1	3	1	4	4	-	-	-	-	
CEE443A: Urban Hydraulics	1	2	1	3	3	-	-	-	-	
CEE457B: Foundations Earthworks and Slope Stability	1.5	-	-	-	-	4	2	6	6	
CEE485B: Sanitary and Environmental Engineering	1.5	-	-	-	-	4	2	6	6	
CEE489A: Transportation and Planning	1	3	2	5	5	-	-	-	-	
CEE493: Civil Engineering Project	2	1	2	3	3	1	3	4	4	
Field Study	-	-	3	3	3	-	4	4	4	A
SLEFR4:	-	-	5	5	2	-	5	5	2	
ATH401:	-	-	2	2	-	-	2	2	-	
PMT 400 Series:	-	-	2	2	-	-	2	2	-	B
Total	13.5	16	22	38	33	18	22	40	39	

NOTE:

A. part of CEE493 Civil Engineering Project

B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

4th Year Computer Engineering

Table 26

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE401B: Military Professionalism & Ethics	1	-	-	-	-	3	-	3	6	
HIE289A: The Impact of Science and Technology on Society and the Environment	0.5	2	-	2	4	-	-	-	-	
CSE341B: Introduction to Database Systems	(1)	-	-	-	-	(3)	(2)	(5)	(5)	B C
EEE403A: Electronic Circuits	1	3	2	5	5	-	-	-	-	A
EEE431B: DSP Hardware	1	-	-	-	-	3	2	5	5	A C
EEE435A: Principles of Operating Systems	1	3	2	5	5	-	-	-	-	
EEE453A: Digital VLSI Design	1	3	2	5	5	-	-	-	-	A
EEE457: Computer Engineering Design Project	2	2	2	4	4	-	4	4	4	
EEE459A: Engineering Human-Computer Interaction	(1)	(3)	(2)	(5)	(5)	-	-	-	-	B
EEE461A: Digital Communications	1	3	2	5	5	-	-	-	-	A
EEE466A: Distributed Applications	(1)	(3)	(2)	(5)	(5)	-	-	-	-	B
EEE469B: Computer Architecture	1	-	-	-	-	3	2	5	5	
EEE473B: Computer Communications	1	-	-	-	-	3	2	5	5	
EEE492A: Software Processes and Work Products	(1)	(3)	(2)	(5)	(5)	-	-	-	-	B
EEE495B: Digital Systems Architecture	1	-	-	-	-	3	2	5	5	A
EEE499B: Real-Time Embedded System Design	(1)	-	-	-	-	(3)	(2)	(5)	(5)	B
SLEFR4:	-	-	5	5	2	-	5	5	2	
ATH401:	-	-	2	2	-	-	2	2	-	
PMT 400 Series:	-	-	2	2	-	-	2	2	-	D
Total	11.5	16.0	19.0	35.0	30.0	15.0	21.0	36.0	32.0	

NOTES:

A. Students selecting Hardware option must take courses marked 'A'

B. Students selecting Software option must take the ones marked 'B'

C. Students may substitute EEE447B for EEE431B or CSE341B, with Departmental approval (see Elec Engr tables)

D. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

4th Year Electrical Engineering

Table 27

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE401B: Military Professionalism & Ethics	1	-	-	-	-	3	-	3	6	
HIE289A: The Impact of Science and Technology on Society and the Environment	0.5	2	-	2	4	-	-	-	-	
EEE403A: Electronic Circuits	1	3	2	5	5	-	-	-	-	
EEE411A: Communication Theory	1	3	2	5	5	-	-	-	-	
EEE417A: Electromagnetic Propagation and Radiation	1	3	2	5	5	-	-	-	-	
EEE425B: Digital Control	1	-	-	-	-	3	2	5	5	B
EEE429A: Electric Machines and Power	1	3	2	5	5	-	-	-	-	A
EEE431B: DSP Hardware	1	-	-	-	-	3	2	5	5	
EEE433B: Satellite and Mobiles Communication	1	-	-	-	-	3	2	5	5	B
EEE441B: Microwave Circuits, Devices and Systems	1	-	-	-	-	3	2	5	5	B
EEE447B: Robotics	(1)	-	-	-	-	(3)	(2)	(5)	(5)	B
EEE449B: Power Electronics	(1)	-	-	-	-	(3)	(2)	(5)	(5)	B
EEE453A: Digital VLSI Design	(1)	(3)	(2)	(5)	(5)	-	-	-	-	A
EEE455: Electrical Engineering Design Project	2	2	2	4	4	-	4	4	4	
EEE473B: Computer Communications	(1)	-	-	-	-	(3)	(2)	(5)	(5)	B
SLEFR4:	-	-	5	5	2	-	5	5	2	
ATH401:	-	-	2	2	-	-	2	2	-	
PMT 400 Series:	-	-	2	2	-	-	2	2	-	C
Total	11.5	16	19	35	30	15	21	36	32	

NOTES:

A. One course to be selected.

B. Three courses to be selected.

C. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

4th Year Mechanical Engineering

Table 28

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE401B: Military Professionalism & Ethics	1	-	-	-	-	3	-	3	6	
HIE289A: The Impact of Science and Technology on Society and the Environment	0.5	2	-	2	4	-	-	-	-	
MEE405B: Computer-Aided Design and Manufacturing for Mechanical Engineers	1	-	-	-	-	3	1	4	4	A
MEE411A: Fluid Mechanics - II	1	3	2	5	5	-	-	-	-	
MEE413B: Fluid Mechanics - III	1	-	-	-	-	3	2	5	5	
MEE421A: Heat Transfer	1	3	2	5	5	-	-	-	-	
MEE431A: Stress Analysis	1	3	2	5	5	-	-	-	-	
MEE433B: Mechanical Behaviour of Advanced Materials	1	-	-	-	-	3	1	4	4	A
MEE443B: Feedback Control of Electro-mechanical Systems	1	-	-	-	-	3	2	5	5	
MEE445A: Modelling and Simulation of Dynamic Systems	1	3	2	5	5	-	-	-	-	
MEE451A: Combustion Engines	1	3	1	4	4	-	-	-	-	
MEE457B: Compressible Flow	(1)	-	-	-	-	(3)	(1)	(4)	(4)	A
MEE461B: Aeronautical and Space Propulsion	(1)	-	-	-	-	(3)	(1)	(4)	(4)	A
MEE467B: Aircraft Performance	(1)	-	-	-	-	(3)	(1)	(4)	(4)	A
MEE469B: Marine Systems Engineering	(1)	-	-	-	-	(3)	(1)	(4)	(4)	A
MEE471: Engineering Project	1.5	-	3	3	3	-	4	4	4	
SLEFR4:	-	-	5	5	2	-	5	5	2	
ATH401:	-	-	2	2	-	-	2	2	-	
PMT 400 Series:	-	-	2	2	-	-	2	2	-	B
Total	12	17	21	38	33	15	19	34	30	

NOTES:

A. Two courses to be selected: both in the Winter term.

B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

4th Year Aeronautical Engineering

Table 29 (offered as of Academic Year 2008-2009)

	CREDIT	Fall Term				Winter Term				NOTES
		Periods/Week				Periods/Week				
		Lecture	Lab./Tut.	Total	Study	Lecture	Lab./Tut.	Total	Study	
PSE401B: Military Professionalism & Ethics	1	-	-	-	-	3	-	3	6	
HIE289A: The Impact of Science and Technology on Society and the Environment	0.5	2	-	2	4	-	-	-	-	
MEE405B: Computer-Aided Design and Manufacturing for Mechanical Engineers	1	-	-	-	-	3	1	4	4	A
MEE411A: Fluid Mechanics - II	1	3	2	5	5	-	-	-	-	
MEE413B: Fluid Mechanics - III	1	-	-	-	-	3	2	5	5	
MEE421A: Heat Transfer	1	3	2	5	5	-	-	-	-	
MEE431A: Stress Analysis	1	3	2	5	5	-	-	-	-	
MEE433B: Mechanical Behaviour of Advanced Materials	1	-	-	-	-	3	1	4	4	A
MEE437B: Robotic Dynamics and Control	(1)	-	-	-	-	(3)	(1)	(4)	(4)	A
MEE443B: Feedback Control of Electro-mechanical Systems	1	-	-	-	-	3	2	5	5	
MEE445A: Modelling and Simulation of Dynamic Systems	1	3	2	5	5	-	-	-	-	
MEE451A: Combustion Engines	1	3	1	4	4	-	-	-	-	
MEE457B: Compressible Flow	(1)	-	-	-	-	(3)	(1)	(4)	(4)	A
MEE461B: Aeronautical and Space Propulsion	(1)	-	-	-	-	(3)	(1)	(4)	(4)	A
MEE467B: Aircraft Performance	(1)	-	-	-	-	(3)	(1)	(4)	(4)	A
MEE469B: Marine Systems Engineering	(1)	-	-	-	-	(3)	(1)	(4)	(4)	A
MEE471: Engineering Project	1.5	-	3	3	3	-	4	4	4	
SLEFR4:	-	-	5	5	2	-	5	5	2	
ATH401:	-	-	2	2	-	-	2	2	-	
PMT 400 Series:	-	-	2	2	-	-	2	2	-	B
Total	12	17	21	38	33	15	19	34	30	

NOTES:

A. Two courses to be selected: both in the Winter term.

B. Professional Military Training (PMT) is delivered in a variety of formats, including two lecture/lab periods per week, on weekends, and on weeknights as appropriate. See PMT section for a detailed breakdown of PMT activity per year.

Scholarships Prizes and Awards

General Information

Regular Officer Training Plan (ROTP)

Officer cadets who are members of the Regular Officer Training Plan have their fees for the entire course paid by the Department of National Defence and, in addition, are entitled to pay and allowances prescribed by the Department. For more details, see the section on Admission Plans.

Scholarships awarded in recognition of academic merit may be retained under the Regular Officer Training Plan.

Reserve Entry Training Plan (RETP)

Officer cadets who are members of the Reserve Entry Training Plan are required to pay fees to defray part of the costs of the academic year. See the section on Admission Plans. Applicants under the Reserve Entry Training Plan may be eligible to apply for some scholarships and bursaries that are available to students at Canadian universities

Provincial Student Awards Programmes

Awards may be available under the terms of the above Programmes to those under the Reserve Entry Training Plan and, in some particular circumstances, under the Regular Officer Training Plan.

Information may be obtained from the Registrar's office.

Scholarships and Bursaries

Scholarships And Bursaries

General Scholarship Fund

Administered by Faculty Council, the General Scholarship Fund permits the introduction of new scholarships, bursaries and prizes, or the augmentation of existing awards. The Fund is made possible through contributions in memory of Ex-Cadets No. 5804 S.G. Esdaile and No. 5522 T.A. Spruston; gift of the late Mrs. Lilian Grier in memory of Ex-Cadet No. 599 Colonel Leroy Fraser Grant; and also through the kind generosity of Bull HN Information Systems Ltd.; Pyrolysis Systems Incorporated; and of Emeritus Professor of Mechanical Engineering, the late Lieutenant-Colonel P.C. King.

The Leonard Foundation

Through the Leonard Foundation created by the late Lieutenant-Colonel Reuben Wells Leonard, RMC No. 87, financial awards are made available on the basis of need to provide assistance to students enrolled in undergraduate programmes. Preference in the selection of students for financial assistance is given to the sons and daughters of clergy, military personnel, school teachers, graduates of the Royal Military College of Canada, members of the Engineering Institute of Canada and members of the Mining and Metallurgical Institute of Canada. The amounts of the awards will vary depending on the applicant's financial situation, but on average will be \$1250 and may be renewed on re-application.

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 the Royal Military College of Canada.

- a. The value of a Dominion Cadetship encompasses:
 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 fifteen 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 subparagraph c. and shall normally be forwarded by the first day of March to a Canadian Forces Recruiting Centre or 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.

Professional Engineers of Ontario Scholarships

Are awarded to eligible students. (Fall)

a. Entrance Scholarship

The Professional Engineers of Ontario Foundation for Education provides two entrance awards to Grade 12 graduates entering an accredited RMC engineering programme. Based upon high Grade 12 standing, one of the awards is made to an eligible female student and one to an eligible male student.

b. Undergraduate Scholarship

The Professional Engineers of Ontario Foundation for Education provides two awards to undergraduate students in either, Second or Third Year of an engineering programme:

1. one to the student who obtained the highest academic standing; and
2. one to the student who exhibited exceptional role model qualities through participation in non-academic activities while maintaining above average marks.

The Dr. P.F. Fisher Memorial Trophy and Scholarship

This scholarship is awarded to the Third Year ROTP/RETP cadet considered most deserving by reason of academic standing, qualities of leadership and sportsmanship. (Fall)

The Duncan Sayre MacInnes Memorial Scholarship

This scholarship is awarded to the Fourth Year cadet who is considered the most deserving of those who accept a regular commission in the military occupation of Aerospace Controller by reason of academic standing, character, and in occupational training where applicable.

This award was first instituted in 1951 by Colonel C.S. MacInnes in memory of his brother the late Brigadier-General Duncan Sayre MacInnes, CMG, DSO, Royal Engineers, who graduated with honours

from RMC in 1897. (Spring)

The C. Raymond Grandy Memorial Scholarship

This scholarship is awarded to the best cadet entering Second Year at RMC as determined by academic standing, leadership potential, and overall performance in the First Year. (Fall)

RCAF Women's Division Scholarships

The RCAF Women's Division Scholarships are awarded to cadets entering the Third Year of a four-year degree programme on the basis of high scholastic achievement and outstanding personal qualifications. One or more awards may be made annually. (Fall)

Army, Navy and Air Force Veterans in Canada - United States Unit Scholarship

The ANAVICUS Scholarship is awarded to the best cadet of Third Year on the basis of personal qualities, academic performance and leadership potential. (Fall)

The W.M. Carleton Monk Memorial Scholarship

This scholarship is awarded to the Reserve Entry applicant in the Fourth Year who obtains the highest marks in academic subjects in the graduating year, provided attendance at a university following graduation. (Spring)

Jack C. Sargent Memorial Scholarship

No. 3091 Jack C. Sargent played intercollegiate hockey for the RMC Redmen throughout his four years at the College. In his memory a scholarship valued at \$1000 is awarded annually to a varsity athlete who demonstrates combined proficiency in academic standing, sportsmanship, leadership and athletic ability. (Fall)

Prizes And Awards

General Information

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.

Definitions:

For the purposes of Prizes and Awards, a cadet is defined as a student enrolled under either the Regular Officer Training Plan (ROTP), the Reserve Entry Training Plan (RETP) or under the University Training Plan, Non-Commissioned Member (UTPNCM). "Student" includes "cadets" and officers enrolled under the Initial Baccalaureate Degree Program (IBDP).

Fourth Year

The Sword of Honour

The Sword of Honour is awarded to the ROTP/RETP cadet of the Graduating Class who best combines

high standards of proficiency in each of the four components of the RMC programme. (Spring)

The Sword of Distinction for Leadership

The Sword of Distinction for Leadership is awarded to the graduating ROTP/RETP cadet who displays outstanding leadership through attaining the highest Cadet appointment of Cadet Wing Senior in their graduating year. (Spring)

The Leinster Shield

The Leinster Shield is awarded to the ROTP/RETP squadron amassing the most points in the Commandant's Competition, with events involving military, athletic and academic prowess. After each event, the squadron leading in the competition flies its pennant from a designated flagstaff and takes the right-of-the-line position on parade. At year's end, the winning squadron will take the right-of-the-line on the Commissioning Parade. The position of right-of-the-line is traditionally a place of honour, as this was the unit that lead the Army into battle.

The Leinster Shield was originally inaugurated in 1892 by the 1st Battalion, Prince of Wales Leinster Regiment (Royal Canadians) for their inter-company challenge shield. The shield came to RMC in 1922 when the Leinster Plate was entrusted to Canada on the disbanding of the Regiment. The Class of 1933 refurbished the Shield for use in the Commandant's Competition. (Spring)

The J. Douglas Young Sword of Excellence

The J. Douglas Young Sword of Excellence is awarded in conjunction with the Leinster Shield on Graduation Parade to the Cadet Squadron Senior (CSS) of the Squadron winning the Commandant's Competition. The sword will be carried by the CSS of the Squadron until the next graduation parade. The fall and winter term CSSs of the winning squadron will receive a commemorative plaque for personal retention. The College Number of the Honour Slate CSS will be engraved on the scabbard to permit a continuing record. The J. Douglas Young Sword of Excellence was donated by the Class of 1933 in memory of their Classmate #2360 John Douglas Young, who was killed in action on D-Day, 6 June 1944. (Spring)

The Victor Van der Smissen-Ridout Memorial Award

The Victor Van der Smissen-Ridout Memorial Award is awarded to the graduating ROTP/RETP cadet deemed to stand highest morally, intellectually, and physically at the Royal Military College of Canada, (Spring)

The Department of National Defence Award of Merit

The Department of National Defence Award of Merit is awarded to the graduating ROTP/RETP cadet attaining highest standards in each of the four components of the RMC programme. The winner of the Wilkinson Sword of Honour is excluded from consideration for this award. (Spring)

The Toronto Branch RMC Club Prize

The Toronto Branch RMC Club Prize is awarded to the Fourth Year ROTP/RETP cadet who obtains the highest combined marks in Drill and Physical Education during the entire course of study at RMC . (Spring)

The Harris-Bigelow Trophy

The Harris-Bigelow Trophy is awarded to the Fourth Year cadet who has displayed the best combination of academic and athletic ability throughout the entire course of study at RMC . This trophy was given for annual competition by the Class of 1932 in memory of their classmates, No. 2039 T.W.E. Harris and No. 2021 J.G. Bigelow (Spring)

The Society of Chemical Industry Award, Canadian Section

The Society of Chemical Industry Award, Canadian Section, is awarded to the student who has the highest standing in the final year of the course in Chemical Engineering, provided that the overall average is at least A- and that the course of study has been completed in the normal number of years. (Spring)

Professional Engineers of Ontario Gold Medal

Professional Engineers of Ontario Gold Medal for academic achievement is awarded each year to the engineering student with the highest academic standing in the final year. (Spring)

The Military Engineering Prize

The Military Engineering Prize is awarded to the best graduating cadet enrolled in the military occupations of Aerospace Engineer, Communications and Electronics Engineer, (Air), Signals, Electrical or Mechanical Engineer, or Engineer, based on high standards of proficiency in each of the four components of the RMC programme. (Spring)

The Navy League of Canada Prize

The Navy League of Canada Prize is awarded to the best Sea Operations cadet (Maritime Surface and Sub-Surface or Maritime Engineering) in the graduating class, based on high standards of proficiency in each of the four components. (Spring)

The Royal Canadian Artillery Association Prize

The Royal Canadian Artillery Association Prize is awarded to the best Land Operations cadet (Armoured, Artillery, Infantry) in the graduating class, based on high standards of proficiency in each of the four components of the RMC programme. (Spring)

The Air Force Association of Canada Award of Merit

The Air Force Association of Canada Award of Merit is awarded in alternate years (even) to the best Air Operations cadet in the graduating class, based on high standards of proficiency in each of the four components of the RMC programme. (Spring)

The Air Cadet League of Canada Award of Merit

The Air Cadet League of Canada Award of Merit is awarded in alternate years (odd) to the best Air Operations cadet in the graduating class, based on high standards of proficiency in each of the four components of the RMC programme of the RMC programme. (Spring)

The Military Support Award of Merit

The Military Support Award of Merit is awarded annually to the best cadet in the graduating class from the Logistics, Health Care Administration, Military Police Officer, or other military occupation of the Support Group, based on high standards of proficiency in each of the four components of the RMC programme. (Spring)

The Panet Cup

The Panet Cup is awarded to the graduating cadet who achieves the highest average score in all four years in the Spring Physical Fitness Test. (Spring)

The Stuart S. Barton Science Award

The Stuart S. Barton Science Award is awarded to the student who has maintained the highest overall academic average in the 4th year of an Honours Science program, provided this average is above 80%. (Spring)

CMR St-Jean Ex-Cadet Prize

CMR St-Jean Ex-Cadet Prize is awarded to the ROTP/RETP Fourth Year Cadet with the most improved second language since entry in the Military College while attaining a superior performance in the other components of the programme. (Spring)

Departmental Medals - Fourth Year

A medal is awarded annually in each academic programme to the cadet standing highest in the programme in the Fourth Year providing an overall average of A- or better has been earned by the recipient. Recipients must have maintained a minimum overall average of B- or better without failures or conditions in the Third Year of study. (Spring)

The MPL Departmental Prize

The MPL Departmental Prize is awarded annually to the cadet in the Fourth Year who obtains the highest aggregate mark over four years in the required courses of study in the Department of Military Psychology and Leadership for a minor in military psychology and leadership. The recipient must have a minimum mark of A- in the required Fourth Year MPL courses. (Spring)

The Governor General's Silver Medal

The Governor General's Silver Medal is awarded to the student with the highest overall average in the Fourth Year of study at RMC, on completion of an Honours or Engineering degree programme with "First Class Distinction" or "with Distinction", provided that a four-year programme of study has been completed and that an overall average of "First Class Distinction" or "with Distinction" has been recorded in Third Year. (Spring)

Third Year

The Royal Military College of Canada Award for Academic Excellence

The Royal Military College of Canada Award for Academic Excellence is awarded annually to the cadet

who has obtained the highest academic standing in the Third Year. (Fall)

The Chemical Institute of Canada Undergraduate Prize

The Governor General's Silver Medal is awarded to the student who obtains the highest standing in Third Year Chemistry and Chemical Engineering. (Fall)

The Corps of Guides Prize

The Corps of Guides Prize is awarded to the cadet who obtains the highest marks in Surveying and Terrain Analysis. (Fall)

The Strong Challenge Shield

The Strong Challenge Shield is awarded to the cadet of the Third Year attaining the highest physical fitness score in the Physical Fitness Test. (Fall)

The Howard B. Ripstein Award of Excellence

The Howard B. Ripstein Award of Excellence is awarded to a cadet of each of the Air, Army, and Navy elements who has completed the third year of undergraduate studies and has demonstrated excellence in all four components of the Royal Military College of Canada programme. (Fall)

Programme Prizes - Third Year

A prize is awarded annually to the cadet standing highest in each academic programme in the Third Year, providing the year has been passed without condition and an overall average of A- or above has been attained. (Fall)

The J.W. Brown Memorial Medal

The J.W. Brown Memorial Medal is awarded to the cadet who obtains the highest academic standing in the Third Year of an Arts programme. The medal is presented in memory of No. 7268 J.W. (Jim) Brown, a 1967 graduate in Commerce and President of the RMC Club of Canada in 1985/86. (Fall)
Second Year

The Royal Military College of Canada Award for Academic Excellence

The Royal Military College of Canada Award for Academic Excellence is awarded annually to the cadet who has obtained the highest academic standing in the Second Year. (Fall)

The Class of 1942 Memorial Trophy

The Class of 1942 Memorial Trophy is awarded to the best all-round ROTP/RETP cadet of the Second Year in academic standing, leadership, and sportsmanship. (Fall)

The Grant Prize

The Grant Prize is awarded to the cadet in Second Year attaining the highest physical fitness score in the Physical Fitness Test. (Fall)

Canadian Military Engineers Association Award

Canadian Military Engineers Association Award is presented to the highest standing Second Year Officer Cadet in Engineering whose classification are either in Engineer (MOC 24) or Airfield Engineer (MOC 46). (Fall)

Departmental Prizes - First and Second Year

A departmental prize is awarded annually to the cadets in First and Second Year who have achieved the highest standing in the several courses of a department provided that the year has been passed without condition and at least A- has been obtained in one of the courses of the department concerned. (Fall)
First Year

The Royal Military College of Canada Award for Academic Excellence

The Royal Military College of Canada Award for Academic Excellence is awarded annually to the cadet who has obtained the highest academic standing in the First Year. (Fall)

The Queen's University Challenge Shield

The Queen's University Challenge Shield is awarded to the best all-round ROTP/RETP cadet of the First Year in academic standing, leadership, and sportsmanship. (Fall)

The Fulton Award

The Fulton Award is awarded to the cadet in First Year attaining the highest physical fitness score in the Physical Fitness Test. (Fall)

The Hope Medallion

The Hope Medallion is awarded to the recruit showing best potential of leadership during the Recruit Camp. This is awarded to the First Year Class Senior. (Fall)

The Howard B. Ripstein Award of Excellence

The Howard B. Ripstein Award of Excellence is awarded to a cadet of each of the Air, Army, and Navy elements who has completed the first year of undergraduate studies and summer training and has demonstrated excellence in all four components of the Royal Military College of Canada programme. (Fall)

The Captain John Bart Teamwork Prize

The Captain John Bart Teamwork Prize is awarded to the First Year team that wins the College's Obstacle Course Competition. It is given in conjunction with the Captain John Bart Leadership Award, which is awarded to the best leader in each Squadron during the Obstacle Race. (Fall)

Departmental Prizes - First and Second Year

A departmental prize is awarded annually to the cadets in First and Second Year who have achieved the highest standing in the several courses of a department provided that the year has been passed without condition and at least A- has been obtained in one of the courses of the department concerned. (Fall)

Not Year Specific

The Lieutenant-Colonel Leroy Fraser Grant Memorial Prize

The Lieutenant-Colonel Leroy Fraser Grant Memorial Prize will be presented to the student of any year who, in open competition, submits the best essay on other than a Canadian or Commonwealth topic. (Spring)

The Padre W.A. Ferguson Shield of Duty

The Padre W.A. Ferguson Shield of Duty is awarded to the Officer Cadet who best exemplifies the qualities of civic duty that are the hallmark of an Ex-Cadet, through contributions to the College, the Club, and his/her community. (Spring)

Military Leadership Excellence Award (Gold Medal, Third Year; Silver Medal, Second Year; Bronze Medal, First Year)

This medal is awarded to the ROTP/RETP cadet attaining the highest standards of proficiency in each of the four components in the Third, Second and First Year of the RMC programme. (Fall)
Canadian Forces Military College Medals And Prizes

The UTPNCM Award of Merit

The UTPNCM Award of Merit is awarded to the graduating UTPNCM cadet attaining the highest standards of proficiency in the four components of the RMC programme. (Spring)

The Class of 78 - Dr. Walter S. Avis UTPNCM Honour Shield

The UTPNCM Honour Shield is presented annually to the UTPNCM graduate who has contributed most to the positive development of the UTPNCM squadron, during the entire time at RMC as determined by a Secret ballot of the Members of the UTPNCM squadron.

The UTPNCM Honour Shield is co-sponsored by the UTPNCM graduating Class of 1978 and by Mrs. W.S. Avis in memory of Dr. Walter S. Avis who was Dean of the Canadian Forces Military College during 1974-80 and a strong supporter of the squadron. (Spring)

Canadian Forces Military College Academic Awards (graduating student)

A medal is awarded annually in each of Honours Arts, Honours Science, and Engineering to the graduating student entering CFMC with Advanced Standing who, having First Class Distinction, stands highest in the course of study, provided that an overall average of Second Class Distinction without failures or conditions was maintained in the Third Year. (Spring)

Prizes will be awarded annually to those students entering CFMC with Advanced Standing who stand highest among the Advanced Standing CFMC students in the years and programmes listed below, provided that the year has been clearly passed without condition and that an overall weighted average of A- or better has been obtained (Spring):

- a. Second Year of a three-year (Pass) programme;
- b. Third Year of three-year (Pass) programme; and

- c. Third Year of a four-year programme in each of Arts, Science, and Engineering.

UTPNCM Drill and Physical Education Departmental Prize.

Prizes are awarded:

- a. To the graduating UTPNCM who has maintained throughout the complete course of study the highest standard in drill and physical education among those graduating (Spring); and
- b. To the UTPNCM not in the graduating year who achieves the highest standard in drill and physical education in the year. (Fall)

Departments

Business Administration

Faculty

Department of Business Administration

Associate Professor and Head of the Department - W.J. Graham, BA, LLB, MBA, PhD

Professor and Chair of the MBA Programme (cross appointed to the Mechanical Engineering Department) - B.W. Simms, CD, rmc, BEng, MASC, PhD, PEng

Professor - W.J. Hurley, BSc, MBA, PhD

Professor - M. Amami, BSc, Lic.Sc.Eco., PhD, Ing

Professor - J. Brimberg, BEng, MEng, PEng, MBA, PhD

Professor - A. St. Pierre, BSc (informatique), BSc (comptables), MBA, EdD, CMA, CGA

Professor (Adjunct) - J.S. Cowan, BSc (Math & Physics), MSc (Physiology), PhD (Physiology)

Associate Professor - T. Dececchi, BEng, MBA, PhD, PEng

Associate Professor - P. Roman, CD, rmc, BEng, PEng, PhD

Associate Professor (Adjunct) - F.P. Wilson, CD, BSc, MEd, PhD

Assistant Professor - N. Essaddam, BAdm, MBA, PhD

Assistant Professor - Major J.M Karagianis, CD, BBA, MBA, Plog

Assistant Professor - M.P. Marelli, DA, MA, MBA

Assistant Professor - Major C.G. Selkirk, DC, rmc, Beng, Meng, PhD, Peng

Assistant Professor - Major P.S. Voyer, CD, BA, MBA

Assistant Professor - F. Yousoffzai, BA, MSc (Economics), PhD

Lecturer - K. Schobel, BA, MBA

Lecturer - M.B.K. Shepherd, BA, MA (Faculty Advisor - ACE)

Programme Objectives

General Information

The study of business administration involves a number of functional areas including accounting, information systems, finance, marketing, operations management and human resource management. These functional areas are developed from a number of basic disciplines. For example, marketing relies

on the disciplines of microeconomics, statistics and psychology, finance relies on mathematics and statistics, operations management also relies on mathematics and statistics, and human resource management relies on psychology and sociology. The practice of business administration does not take place in a vacuum. Understanding the environmental context and its relationship with a functional area is essential to the development of effective decisions, policies and strategies.

The Business Administration Programme will have a threefold thrust. The programme will provide the student with a basic understanding of certain core disciplines such as quantitative methods, economics and psychology. It will also provide the student with a basic understanding of each of the functional areas such as finance, accounting, and marketing. Finally, it will include courses such as Business Policy, which require integration of the functional areas. The emphasis will be on providing the student with a broad, well-grounded education in business administration.

Programme Structures

4 year (Honours or Major)

First Year:

All courses are common for all students in the Arts Programme.

Second Year:

Students will enroll in the Business Administration programme at the beginning of the Second Year.

Third Year:

The programme of studies begins to be specialized in the area of Business Administration. Students will enroll in the Honours or Major program as they register for their 3rd Year courses.

Fourth Year:

The programme of studies is intended to give Business Administration students a well-rounded education in Business Administration rather than being specialized in any one discipline or field. Hence, in the Fourth Year the student will be exposed to advanced material integrated in the programme.

3 year BA (Concentration in Business Admin)

Note: This degree is not open to ROTP/RETP Cadets

The Faculty of Arts offers, through the auspices of the Division of Continuing Studies, a 3-Year General Bachelor of Arts with a concentration in Business Administration.

The program emphasizes a breadth of exposure and is grounded in the elements of the military profession. This is represented through a core of courses that must be taken regardless of discipline. 30 credits must be completed and a credit may fulfill several requirements at the same time, ex: a course could be in Arts (including Business Administration), at the senior level and taken through RMC.

The BA Program includes a compulsory core. Of the 30 credits required 11 credits are mandatory.

Please note that those who have registered in the BA programme offered through DCS prior to Sept. 2003 have the option of completing their studies following an earlier description of the degree and of its core credits or the new one, which integrates the new description and the university level courses of OPME or their equivalent.

Programme Requirements

General Information

4-Year Honours or Major in Business Administration: (for students who entered Business Administration in September 2002 or later).

Students from First Year Arts, with at least a D average, may take either the Honours or Major in Business Administration programme starting in Second Year. The programme of courses for both the Honours and Major is shown below. The requirements for Second Year only are shown in [Table 4](#).

To earn an Bachelor of Arts (Honours Business Administration) degree, a student must:

1. successfully complete the Honours programme, and
2. must maintain a minimum B average in 300 and 400 level Business Administration courses, and
3. must attain a minimum overall B- average in their 4th Year.
4. must maintain at least an overall B- average in each year of the programme to remain in the Honours programme.

Students graduating with a Bachelor of Arts (Major Business Administration) who attain at least an A-average in their 300 and 400 level courses will have their transcripts annotated "*with First Class Distinction*".

Students graduating with a Bachelor of Arts (Major Business Administration) who attain at least a B-average in their 300 and 400 level courses will have their transcripts annotated "*with Distinction*".

All other students will be granted a Bachelor of Arts (Major Business Administration) degree.
Honours Programme

Note: Students who entered the program in academic year 2003/2004 or 2004/2005, please see the program as outlined in the 2003/2004 RMC Undergraduate Course Calendar. There may be some changes in course codes, but the program content will not change.

For students who entered the program in academic year 2005/2006:

Business Admin (18 credits)

- BAE202A/B: Financial Accounting I
- BAE208B: Management Accounting I
- BAE220A/B: Intro to Information Technology
- BAE242A/B: Quantitative Methods I
- BAE300B: Finance
- BAE302A/B: Financial Accounting II
- BAE314A: Marketing Fundamentals
- BAE316B: Intermediate Marketing
- BAE326B: Human Resources Management
- BAE342A/B: Quantitative Methods II
- BAE344B: Operations Management
- BAE410A/B: Information Systems
- BAE420A/B: Business Law
- BAE426A/B: Labour Relations *
- BAE432A: Organizational Theory

- BAE440A/B: International Management
- BAE450A/B: Advanced Topics in Management *
- BAE452: Business Policy

* Students will have the option of taking either BAE426A/B or BAE450A/B. (Both courses will not be offered every year)

Economics (2 credits)

- ECE206A: Macroeconomic Theory and Policy I
- ECE224A: Microeconomics I

Electives (3 credits)

- POE332A: Public Administration in Canada, (is strongly recommended as an elective).

Total: 45 courses (includes 22 course in the Common Arts Core)

Major Programme

Same programme as the Honours, except drop BAE440A/B and ECE206A.

Minor Programme

The Minor is open to Students from all Faculties.

Note: Students who entered the minor in academic year 2003/2004 or 2004/2005, please see the program as outlined in the 2003/2004 RMC Undergraduate Course Calendar. There may be some changes in course codes, but the program content will not change.

For students who started the minor in academic year 2005/2006:

Mandatory Courses

- BAE202A: Financial Accounting I
- BAE208B: Management Accounting I
- BAE220A/B: Introduction to Information Technology
- BAE300B: Finance
- BAE314A: Marketing Fundamentals
- BAE344B: Operations Management

Electives: (2 credits)

- Any other Business Administration 200, 300 or 400 series courses

Note: Science Students taking a Minor in Business Administration will be able to count MAE209A/B Probability and Statistics as an elective course

Joint Honours Degrees

Joint Economics and Business Administration Degree

Economics requirements, 14 credits	Business Administration Requirements, 15 credits
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<ul style="list-style-type: none"> • MAE108B Elements of Calculus • MAE208A Elements of Integral Calculus • ECE102 Elements of Economics • ECE206A Macroeconomic Theory and Policy I • ECE224A Microeconomics I • ECE270A Statistical Analysis I (BAE242A) • ECE308B Macroeconomics Theory and Policy II <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • ECE326B Microeconomics II • ECE424A/B Economics of Defence • ECE450A/B Topics in Microeconomics <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • ECE452A/B Topics in Macroeconomics • ECE492B Economics Seminar <p>Elective courses</p> <ul style="list-style-type: none"> • Minimum of 3 credits in 300 or 400 level economics courses. 	<ul style="list-style-type: none"> • BAE202A Financial Accounting • BAE208B Managerial Accounting • BAE220A/B Information Technology • BAE242A/B Quantitative Methods I (ECE270A) • BAE300B Finance • BAE314A Marketing Fundamentals • BAE316B Intermediate Marketing • BAE326A/B Human Resources Management • BAE342A/B Quantitative Methods II • BAE344B Operations Management • BAE410A/B Management Information Systems • BAE420A/B Business Law • BAE432A Organizational Theory • BAE452 Business Policy
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Notes:

1. Students will use BAE220A/B as their Information Technology (Science elective) course, as students in the Business Administration program do.
2. All students will be taking a total of 46 courses, which is one more than Honours Business Administration students and 3 more than Honours Economics students.

Joint Psychology and Business Administration Degree

Psychology requirements, 14 credits*	Business Administration Requirements, 15 credits
<ul style="list-style-type: none"> • PSE214A/B Research Methodology in Psychology • PSE205A/B Social Psychology • PSE236A/B Cognition and Learning • PSE301A Organizational Behaviour and Leadership • PSE352A Advanced Statistical Analysis for the Behavioural Sciences • PSE328A Group Dynamics • PSE306 /BAE326B Human Resource Management <p>One of</p> <ul style="list-style-type: none"> • BAE342A Quantitative Methods II • BAE420A/B Business Law • A Senior Course in Psychology • PSE401B Military Professionalism and Ethics • PSE454A/B Advanced Leadership • PSE424 / BAE490 Thesis • PSE452A Advanced Research Methods in Psychology <p>* There are 3 cross listed credits in the programme</p>	<ul style="list-style-type: none"> • BAE202A Financial Accounting • BAE208B Managerial Accounting • BAE220A/B Information Technology • BAE242A/B Quantitative Methods I • ECE224A Microeconomics I • BAE300B Finance • BAE314A Marketing Fundamentals • BAE316B Intermediate Marketing • BAE326 / PSE306B Human Resources Management • BAE344B Operations Management • BAE410A/B Management Information Systems • BAE426A/B Labour Relations • BAE432A Organizational Theory • BAE452 Business Policy <p>One of</p> <ul style="list-style-type: none"> • BAE342A/B Quantitative Methods II • BAE420A/B Business Law • A Senior Course in Psychology

Notes:

- All students will be required to take the first year Arts programme with ECE102 and PSE112.
- All students must take the Arts core including MAE208.
- Students will use BAE220A/B as their Information Technology (Science elective) course, as students in the Business Administration program do.
- All students will be taking a total of 47 courses, which is two more than Honours Business Administration students currently take.

Joint Computer Science and Business Administration Degree

Computer Science requirements, 15 credits	Business Administration Requirements, 14 credits
<ul style="list-style-type: none"> • MAE209A Probability and Statistics • MAE229A Linear Algebra • EEE245A Logic Design • CSE321A/B Algorithm Analysis • CSE 350A Data Structure and Algorithms • CSE362A/B Software Development and Professional Practice • CSE 341B Introduction to Database Systems • CSE390A/B Multiprocessing, user interfaces, graphics systems and e-commerce • EEE321B Object Oriented Techniques • EEE351A Computer Organization and Assembly • MAE333A Discrete Mathematics • CSE453A/B Modelling and Simulation* • CSE451A/B Special Topics in Computer Science • EEE435A Principals of Operating Systems • EEE466A Distributed Systems <p>* Optional For Students wishing CIPS accreditation</p>	<ul style="list-style-type: none"> • BAE202A Financial Accounting • BAE208B Managerial Accounting • ECE224A Microeconomics I • BAE300B Finance • BAE314A Marketing Fundamentals • BAE316B Intermediate Marketing • BAE342A/B Quantitative Methods II • BAE344B Operations Management • BAE302A/B Financial Accounting II • BAE326B Human Resource Management • BAE410A/B Management Information Systems • BAE432A Organizational Theory • BAE452 Business Policy

Notes:

- Students would be registered in the BSc programme, and would take the first year Science programme with ECE102.
- All students will be taking a total of 46 courses, which is one more than Honours Business Administration students or Honours BSc. students.

Joint Mathematics and Business Administration Degree

Mathematics requirements, 14 credits	Business Administration Requirements, 14 credits
<ul style="list-style-type: none"> • MAE203 (A and B) Engineering Calculus OR • MAE201 (A and B) Intermediate Calculus • MAE209A/B Probability and Statistics • MAE229A/B Linear Algebra • MAE304A Modern Algebra • CSE350A Data Structures and Algorithms • MAE305(A and B) Differential equations, Boundary Value Problems and Complex Variables • MAE310A Statistics • MAE 456A/B Mathematical Modelling • MAE451A/B Topics in Mathematics <p>Three of</p> <ul style="list-style-type: none"> • MAE234A/B Introduction to Cryptography • MAE236A/B Introduction to Game Theory • MAE331A/B Mathematics of Signal Processing • MAE333A/B Introduction to Discrete Mathematics • MAE340A/B Foundations of Probability • MAE352A/B Non Linear Optimization • MAE354A/B Non Linear Dynamical Systems • MAE374A/B Conflict Analysis • MAE413A/B Mathematical Physics • MAE404 (A and B) Advanced Mathematical Analysis • Students who want the CORS/SCRO diploma would need to take CSE341B and CSE453 in addition to their programme 	<ul style="list-style-type: none"> • BAE202A Financial Accounting • BAE208B Managerial Accounting • ECE224A Microeconomics I • BAE300B Finance • BAE302A/B Financial Accounting II • BAE314A Marketing Fundamentals • BAE316B Intermediate Marketing • BAE326B Human Resources Management • BAE342A/B Quantitative Methods II • BAE344B Operations Management • BAE410A/B Management Information Systems • BAE432A Organizational Theory • BAE452 Business Policy

Notes:

1. Students will take the first year BSc programme with ECE102.
2. All students will be taking a total of 46 courses, which is one more than Honours Business Administration students and 1 more than Honours Science Students.

3-Year BA (Concentration in Business Admin)

Note: The degree is not open to ROTP/RETP Cadets.

Requirements

30 credits must be completed, and of these 30:

- At least 15 must be earned through RMC, (including six in the chosen discipline)
- At least 10 must be at the senior level
- At least 20 must be in Arts, (of which at least 12 must be in Business Administration)
- At least 6 of the 12 Business Administration credits must be at the senior level
- At least 6 of the 12 Business Administration credits must be earned through RMC

Note: A credit may fulfill several requirements at the same time, ex: a course could be in Arts (including Business Administration), at the senior level and taken through RMC. The BA Program includes a

compulsory core.

Mandatory Courses

- HIE208: Canadian Military History: A study in War and Military History, 1867-2000)or another course in Military History, such as HIE205)
- POE206: The Canadian Forces and Modern Society, Civics, Politics and International Relations (or POE205, or POE316 Introduction to International Relations)
- HIE475: Science and War: The Impact of Military Technology
- PSE 402: Leadership and Ethics
- BAE101: Management: Principles and Practices in a Canadian Defence Setting (or BAE100 Principles of management in a Defence Setting)
- At least two credits in English Literature and Grammar.
- At least one credit in Canadian History
- At least one more credit in Military Psychology and Leadership (PSE123 for example)
- At least two credits in Mathematics, Computer Science, Chemistry or Physics (For the concentration in Business Administration, students must take MAE106 and MAE108)

Electives

- Six additional credits of electives in Arts, Science or Technology are also required.

The Business Admin Concentration

Note: Students who entered the program in academic year 2003/2004 or 2004/2005, please see the program as outlined in the 2003/2004 RMC Undergraduate Course Calendar. There may be some changes in course codes, but the program content will not change.

Courses

- BAE202A: Financial Accounting (1 credit)
- BAE208B: Management Accounting (1 credit)
- BAE220A/B: Introduction to Information Technology (1 credit)
- BAE242A/B: Quantitative Methods I (1 credit)
- BAE300B: Finance (1 credit)
- BAE314A: Marketing Fundamentals (1 credit)
- BAE316B: Intermediate Marketing (1 credit)
- BAE326B: Human Resources Management (1 credit)
- BAE344B: Operations Management (1 credit)
- BAE432A: Organizational Theory (1 credit)

Students will also be required to take:

- 1 elective (1 credit) in Business Administration.
- ECE103 (1 credit), and
- ECE104(1 credit) (at a distance), or
- ECE102 (2 credits, on-site at RMC)

Note: Those who have registered in the BA programme offered through DCS prior to Sept. 2003 have the option of completing their studies following an earlier description of the degree and of its core credits or the new one, which integrates the new description and the university level courses of OPME

or their equivalent.

English

Faculty

Department of English

Assistant Professor and Head of the Department - Dr. S. Lukits, BA, MA, PhD

Professor - S.R. Bonnycastle, BA, PhD

Professor - M. Hurley, BA, MA, PhD

Professor - L. Shirinian, BA, MA, PhD

Professor - P.S. Sri, BSc, MA, MA, PhD

Professor Emeritus - T.B. Vincent, BA, MA, PhD

Assistant Professor - Capt. A. Belyea, BA, MA, ABD

Assistant Professor - S. Berg, BA, prof. dipl. ed., MA, PhD

Assistant Professor - Dr. M. McKeown, BA, MA, PhD

Assistant Professor - Dr. L.M. Robinson, BA, MA, PhD

Assistant Professor - Dr. I. Streight, BA, MA, PhD

Programme Objectives

Programme Objectives

The primary purpose of the English Studies programme at RMC is to provide a university-level education to officer cadets as one of the essential elements of their professional development. In meeting that responsibility, the programme is designed to foster both the general intellectual development achieved through university education and the particular skills and insights derived from the study of literary culture and language. At all levels of instruction, the courses offered by the Department have three basic objectives:

- to develop clarity, precision, and maturity in spoken and written communication;
- to focus attention on the importance of cultural and social values in developing an understanding of the forces that have shaped civilization and that are shaping the contemporary world; and
- to develop a flexible intellectual capacity centred around thinking-skills and problem-solving abilities which can be applied to a wide range of professional responsibilities where individuals must take action in the face of concrete human problems.

Communication Skills

In English Studies, particular emphasis is placed on refining writing and verbal skills in the First and Second Year courses, but that emphasis continues in senior courses, especially for those cadets enrolled in the English Honours or General stream of the Humanities degree programme. At the same time,

analytical study of complex literary works develops the other half of communication: the ability to listen carefully and to understand in detail what another person is attempting to communicate. Together, the development of writing and reading skills heighten awareness both of the potential and of the limitations of verbal communication.

Perceptive Insight

The study of literature offers valuable insights into the cultural and social values of a people or a particular group, and acknowledges that these values represent (and have always represented) powerful driving forces shaping the development of any given society, whether it be our own or that of others. At all levels of instruction, English Studies attempt to demonstrate that the influence of social and cultural forces is as important as the role of political, economic, historical and strategic realities in understanding the historical development of societies and the complex nature of the contemporary world.

Intellectual Development

English Studies share with other disciplines a concern for developing traditional patterns of logical analysis and evaluation. However, because of the nature of creative literature, the English programme is also conscious of the value of developing non-linear forms of thought, intuition, imagination, and emotive perception. Such skills are particularly valuable in understanding and dealing with human problems. Creative literature is almost always about understanding a concrete human situation in depth, and the effort to find a creative solution to the problems raised. Studying and analyzing such problems develop a flexible and responsive intelligence, one well suited to the demands of leadership responsibilities.

Programme Structure

Programme Structure

First Year

These courses are designed to refine basic writing and reading skills, and to introduce students to the variety and range of English literature that form an important part of their general cultural heritage.

Second Year

This course is offered to all students in Arts and is designed to explore significant aspects of modern thought, problems, and concerns as a broad foundation in contemporary social and cultural issues for students entering various Humanities, Social Science, and Business Administration degree programmes.

Third and Fourth Years

Senior courses are designed for students pursuing an Honours or a General Humanities degree in English, as well as for those taking English courses as electives for other degree programs. These courses fall into three main groupings.

- **British Literary Tradition**

These courses deal with the works of major English writers from 1550-1945, which collectively represent the intellectual foundation for the literatures of the contemporary world, and transmit the major aspects of European social and cultural values from the Renaissance, the Enlightenment, and the 19th Century to the present.

- **National and Ethnic Literatures of the Contemporary World**

These courses focus on the literatures of various national and ethnic groups in the contemporary world. They are designed to offer insights into the complex spectrum of social and cultural values in the modern world.

- **Special Focus Courses**

These courses focus on a particular genre or are designed for a specific group of students. Two examples of genre-focussed courses are: The Literature of War and Forms of Drama.

Senior Course Structure

Note that most senior offerings are divided into courses of one semester, with the "A" group taught in the Fall Term and the "B" group in the Winter Term. A full course consists of two courses of one semester each, normally linked in subject matter.

For staffing reasons, most senior courses are offered in alternate years. Students are urged to plan ahead and to discuss their whole programme with the Department Head at the time they are applying to enter the English degree stream.

Programme Requirements

General Information

The Department offers three levels of standing in its degree stream:

- Honours
- Major
- Minor

Students normally apply for entry into the English degree program at the end of their second year.

They are encouraged to take as least one full senior English course in addition to ENE200 in their second year (as one of their Arts Electives) in order to create greater flexibility in course selection in third and fourth year.

Honours

Students apply for entry into the Honours programme during their third year.

Students wishing to apply to Honours standing must achieve at least a B- in their second year courses, although individual cases may be accepted on a probationary basis at the discretion of the Department Head.

To complete the honours degree, students must take 10 full or 20 single-semester courses apart from the required core subjects.

They must successfully complete the following obligatory courses:

- ENE110
- ENE200
- ENE326A / ENE324B
- ENE304 or ENE412A / ENE414B
- ENE428

- ENE476A / ENE478B
- 4 full-courses or 8 single-semester courses in English at the 300 or 400 level.

Students must also fulfill the following requirements:

- They must maintain a B average in all of the accumulated senior English courses - those above ENE200.
- They must maintain a B- average in all of their academic courses in 4th year.

Students wishing to receive Honours with "First Class Distinction" must achieve at least an A- average in the senior English courses taken (those above ENE200).

Major

Students wishing to enter this degree programme normally do so at the end of second year.

A major requires 8 full-courses or 16 single-semester courses.

To receive a major students must successfully complete the following courses.

- ENE110
- ENE200
- ENE326A / ENE324B
- One of: ENE304, ENE412A / ENE414B, or ENE476A / ENE478B, (depending on the year's offering, or the student can defer this selection to 4th year)
- ENE428
- 3 full-courses or 6 single-semester courses in English at the 300 or 400 level

Minor

A minor requires a total of 4 full-year courses or 8 single-semester courses beginning with:

-
- ENE200
- 2 full-courses or 4 single-semester courses in English at the 300 or 400 level

Must have a combined average equal to or greater than B- in these courses.

French Studies

Faculty

Department of French Studies

Associate Professor and Head of the Department - M. Benson, BA, BEd, MA, PhD

Professor - G. Quillard, BA, MA (Litt), MA (Lit), PhD

Associate Professor - G.J.A. Monette, BA, MA(Ens), MA(Litt), PhD

Assistant Professor - S. Bastien, BA, MA, PhD

Assistant Professor - F.-E. Boucher, BA, MA (Litt), PhD

Assistant Professor - P.-A. Lagueux, BA, MA, PhD

Assistant Professor - C. Trudeau, BA, MA, PhD

Assistant Professor - J. Le Ber, BA, MA, PhD

Programme Objectives

Introduction

The Department of French Studies offers a programme that focuses on French literature in the francophone world and other aspects of French studies such as civilization and language (linguistics and stylistics).

The Department offers an Honours Bachelor of Arts (French Studies) and a Bachelor of Arts (French Studies). In order to be admitted to these programmes, students must have taken FRF152 and FRF262 or equivalent courses.

French is the only working language within the Department. Most courses may be taken by all students possessing the required knowledge and ability. The final decision on eligibility will be made by the course instructor, with the approval of the Department Head.

The Department also offers courses in Spanish. For students completing an Honours or a Major programme, these courses are considered as courses taken outside the Department.

Programme Objectives

The French Studies programme is intended to provide students with university education, promote their intellectual development and give them the knowledge and abilities that can be gained through the study of literature and language.

The courses offered by the Department have four main objectives:

- to teach students how to express themselves clearly and accurately, orally and in writing, and how to discuss various subjects rigorously and at length;
- to make students aware of interference from the second language;
- to draw students' attention to the importance of cultural and social values in the evolution of civilization and the contemporary world, particularly the French-speaking world; and
- to develop students' intellectual faculties, especially the ability to think and to analyze. These skills are often required in the exercise of their profession, particularly in the areas of human relationships and problems.

Ability to communicate:

While the mastering of oral and written communication is emphasized in the First and Second Year courses, these skills are also stressed in the Third and Fourth Year courses, particularly for students doing an Honours or a Major in French Studies. The analytical study of literary works helps to assess situations with a critical mind.

The analysis of literary texts is useful in developing a critical mind; knowledge of critical and analytical methods leads to a better appreciation of language's potential and limitations.

Perceptual development:

Literary studies enable students to fully understand and appreciate the cultural and social values of a people or community and help them to recognize the forces that shape the evolution of a society. The French Studies programme demonstrates, at all levels, that the influence of cultural and social forces is as important as the influence of political, economic, strategic and historical realities in understanding the past evolution of societies and the complex nature of the contemporary world.

Intellectual development:

French studies, like studies in other disciplines, enable students to acquire the methods involved in logical analysis and evaluation. However, because of the very nature of literature, French studies also help to promote less Cartesian forms of thinking, such as intuition, imagination and a sense of aesthetics. These kinds of thinking are particularly useful for resolving human problems.

A literary work generally deals with human problems and the measures taken to resolve them. These problems require intellectual flexibility and an ability to analyze. Such abilities are extremely useful for people in management and other positions of responsibility.

Programme Structure

Programme Structure

First Year

Courses designed to improve the student's composition, style and understanding of French literature in general and French-Canadian literature in particular.

Second Year

Courses designed to perfect the student's style and to teach an appreciation of the most important French literary works of the 19th and 20th centuries. These courses can also serve as a foundation for future studies in the humanities, social sciences or administration.

Third and Fourth Years

Courses designed mainly for students doing a Major or an Honours in French Studies. These courses may also be taken by students enrolled in other programmes.

The courses cover two main areas:

- literature, and
- linguistics

There are three categories of literature courses:

- French literature,
- French-Canadian literature, and
- literature by French-speaking authors from other cultures.

Structure Of The Third And Fourth Year Courses

Most of the courses offered in the Third and Fourth Years are divided into two half-courses lasting one

semester each (part A is given in the fall; part B in the winter) and given every two years. It is highly recommended that students choose their courses in advance, seek advice from the professors in the Department and discuss their choices with the Department administration.

Programme Requirements

General Information

The Department offers three levels of "standing" in its degree streams:

- Honours
- General
- Minor.

Honours

The Honours French Studies stream requires:

Completion of the four-year Humanities degree programme.

At least ten full courses (or 20 one-term courses) selected from the offerings of the French Studies Department (excluding courses in Spanish). Included in these courses must be:

- FRF152,
- FRF262,
- FRF344A and
- FRF346B, and
- one full course (or 2 one-term courses) in French literature and
- one full course (or 2 one-term courses) in French-Canadian literature.

To maintain Honours standing, students must achieve at least a B average in their French Studies courses in the Third and Fourth Years, and at least a B- average in all their academic courses in Fourth Year.

Students wishing to receive Honours with "First Class Distinction" must maintain an average of at least A- in French Studies courses taken in Third and Fourth Years.

General

The General French Studies Stream requires:

Completion of the four-year Humanities degree programme.

At least eight full courses or (16 one-term courses) selected from the offerings of the French Studies Department (excluding courses in Spanish)

- FRF152,
- FRF262,
- FRF344A, and
- FRF346B
- One full course (or 2 one-term courses) in French literature and
- One full course (or 2 one-term courses) in French-Canadian literature.

Minor

Arts students may take a minor in French Studies. The requirements for the minor are four full courses in French Studies with at least a B- average for the courses.

Military & Strategic Studies Programme

Faculty

Military and Strategic Studies Programme

Chairman and Assistant Professor of History - Major D.E. Delaney, CD, BA, MA, PhD

Programme Objectives

Programme Objectives

This interdisciplinary programme is unique in North America at the undergraduate level. The Military and Strategic Studies (MSS) programme offers students an opportunity to acquire a sound grounding in military history, strategic thought, and international relations, as well as in Canadian government, politics and economics, English or French Studies, and military psychology and leadership. It leads to a Bachelor of Arts degree in Military and Strategic Studies, as a Major or at the Honours level. The MSS degree provides a solid basis for graduate studies and a professional career.

Officer Cadets are encouraged to take at least one MSS course in their second language. Students with the requisite language profile are free to take all or a combination of courses in either official language while earning their degrees.

In addition to their course work, Officer Cadets enrolled in the MSS programme are encouraged to participate in the various extracurricular activities of the programme, including field trips to Ottawa, Washington, New York, USMA, USNA, and NATO HQ and several Model UN and NATO simulations at leading North American universities.

Programme Requirements

General Information

To earn a degree in Military and Strategic Studies students must pursue one of two patterns of study:

1. Military and Strategic Studies; or,
2. Military and Strategic Studies, with a Minor in Military Psychology and Leadership (MPL), Business Administration, Economics, English, or French Studies.

Honours

The following are requirements for an Honours Degree in MSS, a 42-credit degree including the core courses in Arts and Science:

15 credits, comprised of the following mandatory courses:

- HIE 202: Introduction to Canadian Military History (2 credits)
- HIE 270: Introduction to Military History (2 credits)
- HIE 380: Peacekeeping and Peacemaking (2 credits)
- HIE 470: Strategy and Strategists (2 credits)
- POE 316A: Introduction to International Relations (1 credit)
- POE 317B: Introduction to Contemporary Strategic Studies (1 credit)

- POE 460A: International Conflict Analysis (1 credit)
- POE 462B: Current Strategic Issues (1 credit)
- PSE 312A: Military Psychology and Combat (1 credit)
- MSE 424/426: Thesis/Advanced Directed Studies (2 credits)
- A minimum of 5 other credits for subject-field courses, of which 2 must be at the 400 level, approved by the PIC MSS.

Maintain a B average in all mandatory Honours courses identified in a. above.

Maintain a B- average in all academic courses in fourth year.

Major

The following are requirements for a Major in MSS, a 40-credit degree including the core courses in Arts and Science:

13 credits, comprised of the following mandatory courses:

- HIE 202: Introduction to Canadian Military History (2 credits)
- HIE 270: Introduction to Military History (2 credits)
- HIE 380: Peacemaking and Peacemaking (2 credits)
- HIE 470: Strategy and Strategists (2 credits)
- POE 316A: Introduction to International Relations (1 credit)
- POE 317B: Introduction to Contemporary Strategic Studies (1 credit)
- POE 460A: International Conflict Analysis (1 credit)
- POE 462B: Current Strategic Issues (1 credit)
- PSE 312A: Military Psychology and Combat (1 credit)
- A minimum of 3 other credits for subject-field courses, of which 1 must be at the 400 level, approved by the Professor in charge of MSS.

The MSS Major may not be earned as a double major with History or Politics.

Minor

There is no Minor in MSS.

Minors in MPL, Business Administration, Economics, English, or French Studies may be earned together with an Honours or a Major MSS Degree. Students pursuing one or more of these Minors will complete 8 credits in their Minor program, in addition to the core courses in Arts and Science.

History

Faculty

Department of History

Associate Professor and Head of the Department - M.A. Hennessy, BA, MA, PhD

Professor Emeritus - R.A. Preston, BA, MA, PhD, DipED, FRHistS

Professor Emeritus - D.M. Schurman, BA, MA, PhD

Professor and Chair of War Studies - B.C.J. McKercher, BA, MA, PhD, FRHistS

Professor - N.F. Dreisziger, BA, MA, DipREES, PhD

Professor - E.J. Errington, BA, BEd, MA, PhD

Professor - F. Gendron, BA, MA, PhD

Professor - R.G. Haycock, BA, MA, PhD

Professor - A.H. Ion, BA, MA, PhD

Professor - H.P. Klepak, CD, BA, MA, PhD

Professor - K.E. Neilson, Bsc, BA, MA, PhD

Associate Professor - J. Lamarre, BA, MA, PhD

Associate Professor - R. Legault, BA, MA, PhD

Associate Professor - S. Maloney, BA, MA, PhD

Associate Professor - R.A. Prete, BA, MA, PhD

Associate Professor (Adjunct) - Col B. Horn, BA, MA, PhD

Assistant Professor - Major G.M. Boire, CD, BA, MA, bems ESG

Assistant Professor - A.F. Bowker, BA, MA, PhD

Assistant Professor - K. Brushett, BA, MA, PhD

Assistant Professor - Major D.E. Delaney, CD, BA, MA, PhD

Assistant Professor - M. Deleuze, BA, MA, PhD

Assistant Professor - J.L. Kenny, BA, MA, PhD

Assistant Professor - LCol T.W. Loveridge, CD, plsc, pcsc, BA, MA

Assistant Professor ; LCol (retired) J. Marteinson, CD, BA, MA, psc, pcsc, nads

Assistant Professor - B. Richard, BA, MA, PhD

Assistant Professor - R. Stouffer, CD, BA, MA, PhD

Lecturer - Major J.R. Grodzinski, CD, BA, MA

Lecturer - Y. Raic, BA, MA

Lecturer - J. Ridler, BA, MA

Lecturer - E. Spencer, BA, MA

Lecturer - D. Varey, BA, MA

Programme Objectives

The Goals of The Department of History

The Department of History shares in the primary mission of the college's academic wing:

- to provide university-level education to officer cadets as one of the essential elements of their professional development. To this end, the programme in history is designed to meet the specific needs of two types of students - those who major in history and those taking degrees in other departments and divisions who have an interest in the discipline.

The Department of History has three primary goals:

1. to teach the essential elements of the craft of historical analysis, including the ability to think in historical terms, to research various issues and to present information and analysis in sound historiographical arguments both verbally and in writing;
2. to impart the story of the past in both survey and specialist courses that cover national and regional histories (like Canada, France, the Far East, and modern Europe), thematic histories (social, economic, and intellectual) and topical histories (modern international relations, strategic thought, and the military); and
3. to explain and utilise the different historiographic methodologies (economic determinism, realism, corporatism, gender, etc.).

Programme Structure

Entry And Qualifications

The Department introduced a new degree in 2002 and has revised the requirements for degrees in History for students commencing studies in 2002/03. All students pursuing a degree in History are still required to complete the curriculum, as outlined in:

- [Table 1](#)
- [Table 4](#)
- [Table 6](#)
- [Table 12](#)

However, the program of study for students entering 1st year Arts or those entering 2nd year on or after September 2002 who intend to pursue a degree in History will be different than those already in the program.

Programme Requirements

Core Curriculum

The Department offers a number of courses that are required as part of the core curriculum. In many instances, these courses can also be counted towards requirements for a degree or minor in History.

Core history courses for students in the **arts**

- HIE/F102 - Canada

- HIE/F202 - Introduction to Canadian Military History (For students in Business Administration HIE/F203B replaces HIE/F202. It is bly recommended that those wishing a minor in History, or who wish to maintain flexibility to change degree programs take HIE/F202.)
- HIE/F270 for students in history, military and strategic studies (For all other arts students HIE/F271A/B replaces HIE/F270. It is bly recommended that those wishing a minor in History take HIE/F270)

Core history courses for students in science and engineering .

- HIE/F207A - Canada
- HIE/F203B - Introduction to Canadian Military History
- HIE/F271A/B - Introduction to Military History and Thought
- HIE/F 289A- The Impact of Science and Technology on Society and the Environment (an engineering degree requirement only).

Honours

Students Majoring, in History, who wish to pursue an Honours degree, will apply to the Department in the second term of their 3rd year. Eligibility to enter the Honours programme includes; a B- average in 3rd year, maintaining a B average in all History courses to date and, the permission of the Department.

Course Requirements:

- completion of a 42 credit program in the Humanities, including the core curriculum.
- a minimum of 20 credits in History, approved by the department, including:
 - HIE/F102 - Canada
 - HIE/F202 - Introduction to Canadian Military History
 - HIE/F270 - An Introduction to Military History
 - HIE/F384 - Modern Europe*
 - HIE/F424 or HIE/F426 - Thesis or Advanced Directed Studies
- maintain an overall B average in History courses beyond HIE/F202 (ie, for HIE/F270 and 300 and 400 level courses)
- maintain a B- average in all academic courses in the 4 th year

Note: Students who maintain an A- average in all History courses beyond HIE/F202 (ie, HIE/F270 and 300 and 400 level) and, attain a B- average in their 4th year of study will earn Honours with "First Class Distinction".

* It is highly recommended that students take HIE384 in the 2nd Year Major

Course Requirements:

- Completion of a 40 credit program in the Arts, including the core curriculum
- A minimum of 16 credits in History, approved by the department, including:
 - HIE/F102 - Canada
 - HIE/F202 - Introduction to Canadian Military History
 - HIE/F270 - An Introduction to Military History

- HIE/F384 - Modern Europe *
- 8 other history credits, of which at least 4 at the 400 level

* it is highly recommended that students take HIE384 in 2nd year.

Double Major

Students wishing to complete a double major, one of which is in History, are required to complete the 16 credits as above, and meet the requirements for a major as set out in the second discipline.

Minor in History

Open to students in any program at RMC

Course Requirements:

- 8 credits in History
- maintain at least a B- average in all History courses.

Military Psychology & Leadership

Faculty

Department Of Military Psychology And Leadership

Associate Professor and Head of the Department - R.C. St. John, BA, MA, PhD

Associate Professor - M.M.D. Charbonneau, BEng, MA, PhD

Associate Professor - Lieutenant-Colonel J. Knackstedt, CD, BComm, MASc, PhD

Associate Professor - A.A.M. Nicol, BSc, MA, PhD

Associate Professor - A. Okros, CD2, OMM, BComm, MASc, PhD

Assistant Professor - Major S. Blanc, CD, BA, MSc

Assistant Professor - J.P. Bradley, CD, BA, MA, PhD

Assistant Professor - L. Cherif, BA, MA, PhD

Assistant Professor - R. Dickenson, CD, BA, MA

Assistant Professor - Major R. Porter, CD, BA, MSc

Programme Objectives

Programme Objectives

The programme in Military Psychology and Leadership offers an opportunity to examine in greater detail issues raised in the core curriculum. The objectives of the programme are to: (a) provide a theory-based programme of study that is applicable to all military occupations; and (b) offer a programme of studies that enhances the major programmes of studies offered by other departments in the Faculty of

Arts.

The programme focuses on the application of psychology in particular, and behavioural science in general, to the military workplace and military operations. Thus, the courses of the programme examine topics like motivation, leadership, self-awareness, group processes, cultural issues, interviewing and counselling, occupational and operational stress, combat psychology, human resource management, persuasion and influence, human-machine interaction, and research methodology. A concentration in Military Psychology and Leadership is an excellent complement to all RMC programmes as well as an exceptional means of developing students' leadership ability and understanding of human behaviour.

Mandatory Courses

Introduction

The Military Psychology and Leadership Department recognizes the need to provide leadership education, raise social consciousness and positively impact the psychological, philosophical and moral development of students. To achieve these goals, the Department offers mandatory courses as part of the core curriculum required by students in First, Third, and Fourth Years of study. The focus and scope of each is described below.

First Year

Meeting the increasingly unique and complex challenges of an officer in the Canadian Forces requires a combination of conceptual, technical, interpersonal, and professional skills which were not required only a short while ago. To prepare officers for their future leadership responsibilities, the psychology programme promotes an appreciation of human behaviour by providing separate introductory courses for Arts, Science and Engineering students that focus on basic psychological phenomena such as learning, perception, memory, personality and emotion. Beyond self-awareness, an officer must be able to determine the appropriate type and degree of influence required for effective leadership of individuals and groups. Students examine human behaviour in organizational and social contexts by studying such topics as values, attitudes, obedience, aggression, racial and gender relations, and prejudice. More on the First Year courses is provided in the Course Description section under Course Number PSE112 for Arts students and PSE123 for Science and Engineering students.

Third Year

An important element of successful leadership is an officer's ability to diagnose organizational performance, adapt effective leadership approaches to various situations, and convey the appropriate leadership style to followers. This ability is developed in Third Year by Course Number 301 which has been designed to help students understand leadership theory, human motivation, power and politics, organizational culture, and managing resistance to change. More on this Third Year course is provided in the Course Description section (see Course Number PSE301).

Fourth Year

An officer's ability to function will be greatly impaired if his/her leadership is perceived to lack integrity. Thus, the Department focuses on the necessity for personal integrity, the importance of human dignity, and the need to reflect continually on one's own values and professional conduct in Fourth Year. The department reinforces these concepts in Course Number 401 by readings and discussions centered on the function of ethics in social and organizational life, ethical theories and decision criteria which distinguish between right and wrong, the impact of situational factors on ethical behaviour, the nature of military professionalism and ethical obligations, specific codes of conduct extant in war, and value conflicts and moral dilemmas inherent in military service. More on this Fourth Year course is provided in the Course Description section. (see Course Number PSE401).

Mandatory Courses by Year

The following table lists the Military Psychology and Leadership Department courses included in the core curriculum for Arts and Engineering and Science students:

	Arts Students	Engineering or Science Students
Yr 1	PSE112 Intro to Psychology	PSE123B Fundamentals of Human Psychology
Yr 2	No requirement	No requirement
Yr 3	PSE301A Organizational Behaviour and Leadership	PSE301A Organizational Behaviour and Leadership
Yr 4	PSE401B Military Professionalism and Ethics	PSE401B Military Professionalism and Ethics

Programme Requirements

Programme Requirements

Students successfully completing their First Year in Arts are eligible for entry into the programme leading to a Honours degree, a Major Degree, or a Minor in Military Psychology and Leadership. Students are normally admitted to these programmes after first year with permission of the Department Head. Students normally apply for Honours at the beginning of third year. Students in the Honours programme are required to complete a thesis in fourth year.

Honours

Maintain a B average in all 300 and 400 level MPL courses;

Maintain an overall B- average in fourth year; and have no failures in third or fourth year.

Minimum of 42 credits, including core curriculum courses.

Minimum of 20 credits in Military Psychology and Leadership approved by the department, including:

Core curriculum courses (4 credits):

- PSE112-Introduction to Psychology
- PSE301A-Organizational Leadership and Behaviour
- PSE401B-Military Professionalism and Ethics

Mandatory Programme courses (9 credits):

- ECE270A - Statistical Analysis for Social Scientists I
- PSE214A/B - Research Methodology in Psychology
- PSE205A/B - Social Psychology
- PSE236A/B - Cognition and Learning
- PSE352A/B - Advanced Statistical Analysis for the Behavioural Sciences
- PSE454A/B - Advanced Leadership
- PSE452A/B - Advanced Research Methods in the Behavioural Sciences
- PSE424 - Thesis

Note: For the Academic Year commencing September 2005, ECE372B (Statistical Analysis for Social Scientists II) may be substituted for PSE352A/B (Advanced Statistical Analysis for the Behavioural

Sciences).

Optional Programme Courses (7 credits)

Note:

A minimum of 1 should be at the 400 level:

- PSE328A/B-Group Dynamics
- PSE306A/B-Human Resource Management
- PSE312A/B-Applied Military Psychology
- PSE320A/B-Sociology of the Armed Forces
- PSE324A/B-Cross-Cultural Psychology
- PSE332A/B-Introduction to Interviewing and Counseling
- PSE346A/B-Persuasion and Influence
- PSE444A/B-Sports Psychology
- PSE462A/B-Human Factors in Applied Military Science
- PSE464A/B-Directed Studies in Military Psychology
- PSE466A/B-Directed Studies in Sociology of the Armed Forces
- PSE465A/B-Directed Studies in Military Leadership

Note: Students may take up to two credits as optional program courses from St-Lawrence College or Queen's University, with the approval of the Department Head.

Major

Minimum of 40 credits, including curriculum courses.

Minimum of 16 credits in Military Psychology and Leadership approved by the department, including:

Core curriculum courses (4 credits)

- PSE112-Introduction to Psychology
- PSE301A-Organizational Leadership and Behaviour
- PSE401B-Military Professionalism and Ethics

Mandatory Programme courses (5 credits)

- ECE270A-Statistical Analysis for Social Scientists I
- PSE214 A/B-Research Methodology in Psychology
- PSE205A/B-Social Psychology
- PSE/236A/B-Cognition and Learning
- PSE454A/B-Advanced Leadership

Optional Programme courses: (7 credits)

Note: a minimum of 1 should be at the 400 level.

- PSE328A/B-Group Dynamics
- PSE306A/B-Human Resource Management
- PSE312A/B-Applied Military Psychology
- PSE320A/B-Sociology of the Armed Forces

- PSE324A/B-Cross-Cultural Psychology
- PSE332A/B-Introduction to Interviewing and Counseling
- PSE346A/B-Persuasion and Influence
- PSE352A/B-Advanced Statistical Analysis for the Behavioural Sciences
- PSE444A/B-Sports Psychology
- PSE462A/B-Human Factors in Applied Military Science
- PSE464A/B-Directed Studies in Military Psychology
- PSE466A/B-Directed Studies in Sociology of the Armed Forces
- PSE465A/B-Directed Studies in Military Leadership

Note: Students may take up to two credits as optional program courses from St-Lawrence College or Queen's University, with the approval of the Department Head.

Minor

Minimum 8 credits in Psychology, including core curriculum courses.

Core curriculum courses (4 credits):

- PSE112-Introduction to Psychology
- PSE301A-Organizational Leadership and Behaviour
- PSE401B-Military Professionalism and Ethics

Mandatory Programme courses (1credit)

- PSE214A/B-Research Methodology in Psychology

Optional Programme courses (3 credits)

- Any course offered by the department, with the permission of the Department Head.

Note: Students may take up to two credits as optional program courses from St-Lawrence College or Queen's University, with the approval of the Department Head.

Note: Students entering their third or fourth academic year in September 2005 may be admitted to the programme provided they can demonstrate that they can complete the programme requirements in their remaining year(s).

Note: For the Academic Year commencing September 2005, ECE372B- Statistical Analysis for Social Scientists II may be substituted for PSE352A/B-Advanced Statistical Analysis for the Behavioural Sciences.

Politics & Economics

Faculty

Department of Politics and Economics

Professor of Politics and Head of Department - H. Hassan-Yari, BA, MA, PhD

Professor Emeritus - H.H. Binhammer, ndc, BA, MA, PhD

Professor Emeritus - J.P. Cairns, ndc, BA, MA, PhD

Professor Emeritus - M.D. Chaudhry, BA, MA, PhD

Professor of Politics and Dean of the Faculty of Arts - J.J. Sokolsky, BA, MA, PhD

Professor of Politics and Vice Dean of the Division of Continuing Studies - P. Constantineau, BA, MA, PhD

Professor of Economics (cross appointed to the Business Administration Department) and Chair of Defence Management - P.J.S. Dunnett, BSc, MA, PhD

Professor of Politics - J.S. Finan, BA, MA, PhD

Professor of Geography - L.Y. Luciuk, BSc, MA, PhD

Professor of Economics - L.C. McDonough, rmc, BA, MA, PhD

Professor of Economics - P.J. Paquette, BCom, MA, PhD

Professor of Politics - A.J. Whitehorn, BA, MA, PhD

Professor of Politics (Adjunct) - W.H. Dorn, BA, MA, PhD

Professor of Politics (Adjunct) - J.Y. Gagnon, BA, MA, PhD

Professor of Politics (Adjunct) - A. Livingstone, BA, MA, PhD

Professor of Politics (Adjunct) - S. Meharg, BA, MA, PhD

Professor of Economics (Adjunct) - B. Solomon, BA, MA, PhD

Professor of Politics (Adjunct) - J.C. Stone, BA, MA, PhD

Associate Professor of Politics and Chair of Canada Research Chair - J. Boulden, BAH, MA, LLM, PhD

Associate Professor of Politics and Registrar - Lieutenant-Colonel D.M. Last, BA, MA, MMAS, PhD

Associate Professor of Geography - G. Labrecque, BA, LLL, MA, PhD

Associate Professor of Politics - N. Schwartz-Morgan, BA, MA, MA, PhD

Associate Professor of Politics - J.D. Young, BA (Hons), MScSoc, PhD

Assistant Professor and Director of Office of Military Legal Education - Lieutenant-Colonel M.B. Philippe, CD, LLB, LLM

Assistant Professor of Economics - U.G. Berkok, BA, MA, PhD

Assistant Professor of Politics - A.G. Dizboni, BA, MA PhD

Assistant Professor of Military Legal Education - Lieutenant (N) P. Goldman, BA, LLB, LLM

Assistant Professor of Economics, A. Khazri, BA, MA, PhD

Assistant Professor of Politics - Lieutenant-Colonel D.A. La Carte, rmc, CD, BA, MA, PhD (ABD)

Assistant Professor of Politics - C. Leuprecht, BA, DÉA, MA, MA, PhD

Assistant Professor of Politics - A. Ousman, BA, MA, PhD

Lecturer of Economics - M.D. Khan, BA, MA

Programme Objectives

Introduction

The primary purpose of the Politics and Economics Department is to provide the Officer Cadets of the Royal Military College of Canada with the best possible university-level education in two major fields of the social sciences - economics and politics. This education must benefit first and foremost the students themselves and, as a direct consequence, the professional development of the future officers of the Canadian Forces. The quality of this education must be such that the doors of every graduate school will be opened to the best of these students.

Social scientists seek to understand and to analyse human behaviour. In their study of society they make both normative and positive statements. Normative statements concern what one believes ought to be. They are based on value judgements related to philosophical, cultural and religious systems. Positive statements, on the other hand, are about matters of fact. They are testable statements and can be proved by empirical evidence. Successfully predicting the behaviour of a large group of people, for example, is made possible by the statistical "law" of large numbers which asserts that irregularities in individual behaviour tend to cancel each other out and regularities tend to show up in repeated observations.

Language and writing skills are a basic requirement for studying social sciences. Hence students are encouraged to take maximum advantage of all the opportunities, including the services of the Writing Centre, made available to them during their first two years of study to develop these skills.

Political Science

Courses in political science focus on a broad spectrum of domestic and international social issues whose resolution has political implications.

Courses cover a range of issues from the following fields of study:

- Canadian politics;
- International relations;
- Comparative politics;
- Political theory;
- Public administration and policy;
- Geography

Students will complete the following fields of study:

- The study of Canadian politics examines the structure, the institutions and the decision-making process of the Canadian polity in the context of the roles and goals of the citizens in the polity. Political parties, interest groups, elections, the Constitution, the Charter of Rights, the Judiciary

and the rule of law are closely scrutinized. While POE328A and POE330B provide an overview of all aspects of Canadian politics, POE416A concentrates on defence and foreign affairs.

- In POE316A students are introduced to the theory and practice of international relations, while in POE317B contemporary strategic studies are covered. This is followed by POE412 which focus on contemporary foreign and defence policies of the United States. POE460 / POE462 deals with international conflict analysis from the political, economic, social and military perspectives. All aspects of terrorism are discussed in POE458, while POE413 analysis the nuclear issues.
- Each country in the world has adopted a somewhat different system of government that reflects its particular history, development, culture, values and resources. The study of comparative politics examines the diversity of political systems and approaches. In POE320A and POE322B students are introduced to theories of comparative politics and their application. POE424A focuses on the theories of modernization and political development in the Third World, while POE426B involves case studies of selected countries.
- Political theory studies the methods of inquiry of political analysis and considers the tenants of the political philosophers over the centuries. Every course in politics is founded on political theory, especially POE106, 312A, 314B, 328A, and POE418A and POE420B which deals with political "isms" (i.e. socialism, liberalism, capitalism, etc).
- Modern governments are large organizations or bureaucracies faced with problems of leadership and authority, communication and accountability, policy formulation and delivery, and many others. How governments organize themselves to solve these problems is the study of public administration. In POE332A students study organization theory and its application to the practice of public administration in Canada. POE334B studies theories of public policy-making and their application in the federal government of Canada.
- Geography courses survey the evolution of regions, geopolitical patterns and processes including disintegration of empires, geostrategic theories, spacial patterns, migration, demographics, and the ecological consequences of resource exploitation. In GOE202 students study basic concepts of political geography. Four major regions of the world are studied in GOE305A and GOE307B while GOE418B analyses different approaches to cultural and historical geography. Seminar courses address urban-economic and cultural geography of North America, geopolitical aspects of international law and maritime boundaries. The - Distinguished Speakers Series in Political Geography- addresses contemporary geopolitical issues.

Economics

Economics is a social science in that it studies social problems of choice from the scientific viewpoint, which means that it is built on a systematic explanation of problems of choice where resources to satisfy unlimited human wants are scarce. This systematic explanation involves both the formation of theories and the examination of data. Unlike the approach generally used by political scientists, economists commonly construct models of the economy using varying degrees of mathematical sophistication to depict particular features of the economy with which they are concerned.

Students are introduced to economics in the First Year course, ECE102- Elements of Economics. This course which familiarizes students to the methods of economics is divided into microeconomics and macroeconomics. Microeconomics studies the behaviour of individual decision makers such as firms and households. It deals with determination of prices and quantities in individual markets and with the relationship among markets. In contrast, macroeconomics looks at the behaviour of the economy as a whole, in particular the behaviour of such aggregate measures as overall rates of unemployment, inflation, economic growth and the balance of trade. Separate courses taken by all students, ECE206A, ECE308B, ECE224A and ECE326B, concentrate on macroeconomics and microeconomics, respectively, in much greater depth with respect to both theory and policy issues.

In addition to the above courses in economics all student are required to take a one-term course in Statistical Analysis for Social Scientists. To complete the number of courses in economics required in the two senior years, students may select the appropriate number from the following courses:

- ECE300B - Money, Financial Institutions and Markets
- ECE312B - The Development of Economic Ideas
- ECE316A - Canadian Economic History
- ECE318B - International Economic Problems
- ECE320A - Industrial Organization
- ECE372B - Statistical Analysis for Social Scientists II
- ECE411A/B - Public Finance
- ECE417A/B - International Economics
- ECE424B - Economics of Defence
- ECE428B - Economics of National Security
- ECE442A - Economics of the Environment
- ECE444B - Cost Benefit Analysis of Environmental Issues
- ECE450A - Topics in Microeconomics
- ECE452B - Topics in Macroeconomics
- ECE492B - Direct Readings in Economics Seminar

Students who contemplate later on pursuing postgraduate degrees in economics are strongly urged to include the two courses in quantitative analysis in their undergraduate studies. They also are encouraged to take as many courses in economics as are allowed in the economics degree programme at the College.

Political Science Programme Requirements

General Information

Students successfully completing their First Year in Arts are eligible for entry into the programme leading to an Honours or Major Degree in Political Science. The First Year political science courses are part of the core compulsory courses and will count toward the degree requirements noted below. In consultation with the Department Head, students will select courses each year which fulfil the degree requirements which are best suited to student interest.

Note: Students who entered 1st year in 2002-2003 should take courses in the following order:

First Year

- MAE100 + MAE106B or
- if required MAE103A + MAE106B + one other science core course

Second Year

- two science core courses or CCE106A + PHE202B
- if required + MAE100 (if not taken in first year)

Third and Fourth Year

- all remaining science core requirements, should be spread evenly over the two years.

Note: Students entering 1st year in 2003-2004 will take MAE108B in first year and MAE208A in second year (instead of MAE100), and should take courses in the following order:

First Year

- MAE106A + MAE108B or
- MAE103A + MAE106A + MAE108B

Second Year

- MAE 208A + two science core courses or
- CCE106A + PHE202B if required

Third and Fourth Year

- all remaining science core requirements, should be spread evenly over the two years.

For Business Administration the course BAE220A (or BAE208A or BAE304A and BAE410A combined) satisfies the Information Technology (IT) core curriculum requirement, and BAE242B counts as a Science Elective.

For Economics the course ECE270A (BAE242) counts as a Science Elective, and BAE220A satisfies the Information Technology (IT) core curriculum requirement. (Note: Students taking BAE220A cannot also take CSE260 for credit or vice versa.)

Honours

Minimum of 42 credits, 17 of them being mandatory

Minimum of 20 courses in Politics

Mandatory Courses:

- POE106: Canadian Civics and Society
- GOE202A/B: Introduction to Political Geography
- POE312A: Classical Political Philosophy
- POE314B: Modern Political Philosophy
- POE316A: Introduction to International Relations
- POE317B: Introduction to Contemporary Strategic Studies
- POE320A: Comparative Politics I (Theory and Method)
- POE322B: Comparative Politics II (Country Case Studies)
- POE328A: The Canadian Constitution, Federalism and Regionalism
- POE332A: Public Administration in Canada
- POE416A/B: Contemporary Canadian External Relations and Defence Policy

At least 8 other Politics courses of which 4 at the 400 level (in addition to POE416A/B).

Minimum B average in all 300 and 400 level Politics courses and an overall B- average in the Fourth year of study.

Optional Courses

To take at least 5 credits amongst the following:

- POE330B: Canadian Political Parties and Public Opinion

- POE334B: Canadian Public Policy Making
- POE412B: Contemporary American Foreign & Defence Policy
- POE413: Nuclear Weapons & International Relations
- POE418A: Major Political Ideologies
- POE420B: Contemporary Political Ideologies
- POE422: International Conflict Analysis
- POE423A: Middle Eastern Issues
- POE424A: Theories of Modernization and Political Development
- POE426B: Selected Case Studies of Third World Countries
- POF428A: Théorie politique contemporaine
- POF430A/B: Théorie politique avancée
- POE450B: Space Policy
- POE458A: Post-Cold War Terrorism
- POE460A: Contemporary Analysis of International Conflicts
- POE462B: Current Strategic Issues
- POE488A/B: The Law of Armed Conflict
- Canadian Geograph
- GOE305A: World Regional Geography: Europe and /or the Americas
- GOE307B: World Regional Geography: Asia and /or Africa
- GOE404B: Issues in Contemporary Geopolitics
- GOE418A/B: Approaches to Cultural and Historical Geography
- GOF420A/B: Fondements géopolitiques du droit international (french only)
- GOF422A/B: Géographie politique du Canada (french only)
- GOE490: Directed Readings in Geography

Optional Cross-listed Courses

Maximum of 2 credits selected from amongst the following:

- ECE206A: Macroeconomic Theory and Policy I
- ECE208B: Macroeconomic Theory and Policy II
- ECE224A: Microeconomic Theory and Policy I
- ECE226B: Microeconomic Theory and Policy II
- ECE270A: Statistical Analysis for Social Science I
- ECE272B: Statistical Analysis for Social Science II
- ECE312B: The Development of Economic Ideas
- ECE316A: Canadian Economic History
- ECE411A/B: Public Finances
- PSE301A: Organisational Behaviour and Leadership (mandatory for all 3rd year students)
- BAE330A: Organizational Theory (optional because of PSE301A)
- HIE380: Peacekeeping & Peacemaking
- HIE406A: Canadian External Relations
- HIE408B: Canadian Defence Policy
- HIE417: US Foreign Policy
- HIF432: Histoire diplomatique et militaire de l'Amérique latine (french only)

Minimum B average in all 300 and 400 level courses in the Programme and an overall B- average in the Fourth year of study.

Major

Requires 40 credits, starting in September 2004

16 credits in Politics, the following of which are mandatory courses:

Mandatory Courses

- POE106: Canadian Civics and Society
- GOE202A/B: Introduction to Political Geography
- POE312A: Classical Political Philosophy
- POE314B: Modern Political Philosophy
- POE316A: Introduction to International Relations
- POE320A: Comparative Politics I
- POE328A: The Canadian Constitution, Federalism and Regionalism
- POE416A/B: Contemporary Canadian External Relations and Defence Policy

Optional Courses

Minimum of 8 other Politics credits of which 4 should be at the 400 level.

- POE317B: Introduction to Contemporary Strategic Studies
- POE322B: Comparative Politics II (Country Case Studies)
- POE330B: Canadian Political Parties and Public Opinion
- POE332A: Public Administration in Canada
- POE334B: Canadian Public Policy Making, Theory and Practice
- POE412B: Contemporary American Foreign and Defence Policy

POE413A: Nuclear Weapons and International Relations

- POE418A: Major Political Ideologies
- POE420B: Contemporary Political Ideologies
- POE423A: Middle Eastern Issues/Problèmes du Moyen-Orient
- POE424A: Theories of Modernization and Political Development
- POE426B: Selected Case Studies of Third World Countries
- POF428A: Théorie politique contemporaine (french only)
- POF430B: Théorie politique avancée (french only)
- POE450B: Space Policy
- POE458A: Post-Cold War Terrorism
- POF460A: Analysis of Contemporary Strategy and Conflict (french only)
- POF462B: Actualité stratégique (french only)
- POE488A/B: The Law of Armed Conflict
- POE490: Directed Readings

Minor

All students may take a Minor in Political Science. The requirements for the Minor are 8 courses in the discipline. The First Year course in Political Science POE106 can count toward the Minor. Students choosing to minor in Political Science must maintain a minimum of a B- average in their three best courses of the Minor.

Economics Programme Requirements

General Information

Students successfully completing their First Year in Arts are eligible for entry into the programme leading to an Honours or Major Degree in Economics. The First Year economics courses are part of the core compulsory courses and will count toward the degree requirements noted below. In consultation with the Department Head, students will select courses each year which fulfil the degree requirements which are best suited to student interest.

Honours

Minimum B average standing in all 300 and 400 level courses in the programme and an overall B-average in Fourth Year of study.

Starting in September 2004

Requires 42 credits

Minimum of 20 courses in Economics.

Mandatory Courses

- MAE108B: Elements of Differential Calculus
- MAE208A: Elements of Integral Calculus (Linear Algebra)
- ECE102: Elements of Economics
- ECE206A: Macroeconomic Theory and Policy I
- ECE224A: Microeconomics I
- ECE270A: Statistical analysis for Social Scientists I
- ECE308B: Macroeconomic Theory and Policy II
- ECE326B: Microeconomics II
- ECE372B: Statistical analysis for Social Scientists II
- ECE424B: The Economics of Defence

One of the following two:

- ECE454A/B: Topics in Microeconomic Analysis
- ECE456A/B: Topics in Macroeconomic Analysis

Optional Courses

A minimum of 6 credits, from the following:

- ECE300A/B: Money, Financial Institutions and Markets
- ECE312A/B: The Development of Economic Ideas
- ECE316A/B: Canadian Economic History
- ECE318B: International Economic Problems
- ECE320A/B: Industrial Organization
- ECE411: Public Finances
- ECE417: International Economics
- ECE428A/B: Economics of National Security
- ECE442A: Economics of the Environment
- ECE446B: Cost Benefit Analysis of Environmental Issues
- ECE490: Direct Readings in Economics / Études dirigées en économie

A maximum of 1 credit chosen from the following:

- BAE300B: Finance
- BAE342A: Quantitative Methods II
- BAE430B: Labour Relations and Topics in Human Resources Management
- POE332A/B: Public Administration in Canada.

Note: Any other course approved by the Department

Joint Honours Degree For details see the Business Administration Department or follow this link: Joint Economics and Business Administration Honours Degree Major

Starting in September 2004

Requires 40 credits

Minimum 16 credits in Economics

Mandatory Courses (11 credits)

- MAE108B: Elements of Differential Calculus
- MAE208A: Elements of Integral Calculus (Linear Algebra)
- ECE102: Elements of Economics
- ECE206A: Macroeconomic Theory and Policy I
- ECE224A: Microeconomics I
- ECE270A: Statistical analysis for Social Scientists I

One of the following two:

- ECE308B: Macroeconomic Theory and Policy II
- ECE326B: Microeconomics II

And one of the following two:

- ECE454A/B: Topics in Microeconomic Analysis
- ECE456A/B: Topics in Macroeconomic Analysis

Plus:

- ECE424B: The Economics of Defence
- ECE492B: Economics Seminars

Note: Any other course approved by the department

Optional Courses

Minimum of 4 credits from the following:

- ECE300A/B: Money; Financial Institutions and Markets
- ECE312A/B: The Development of Economic Ideas
- ECE316A/B: Canadian Economic History

- ECE318A/B: International Economic Problems
- ECE320A/B: Industrial Organization
- ECE372A/B Statistical Analysis for Social Scientists II
- ECE411: Public Finances
- ECE417: International Economics
- ECE442A: Economics of the Environment
- ECE446B: Cost Benefit Analysis of Environmental Issues
- ECE490: Direct Readings in Economics

Maximum of one credit from the following

- BAE300B: Finance
- BAE342A: Quantitative Methods II
- BAE430B: Labour Relations and Topics in Human Resources Management
- POE332A/B: Public Administration in Canada

Note: Any other course approved by the Department
Double Major

Minimum of 16 credits in Economics. The 16 credits are the same as per Major. The requirements of the other major to be defined by the department.

Minor

All students may take a Minor in Economics. The requirements for the Minor are 8 courses in the discipline. The First Year course in Economics can count toward the Minor. Students choosing to minor in Economics must maintain a minimum of a B- average in their three best courses of the Minor.

Mandatory Courses

- ECE102: Macroeconomic Theory and Policy I
- ECE224A: Microeconomics I
- ECE270A: Statistical analysis for Social Scientists I

At least one of:

- ECE308B: Macroeconomic Theory and Policy II
- ECE326B: Microeconomics II

Optional Courses

- 2 Other credits in Economics at the 300-400 level.

Mathematics & Computer Science

Faculty

Department of Mathematics and Computer Science

Professor Emeritus - S.D. Jog, BSc, MSc, MSc, PhD

Professor and Vice-Principal (Continuing, Integrated and Satellite Programs), and Director of Learning Management at the Canadian Defence Academy - A.J. Barrett, CD, rmc, BSc, MSc, PhD

Professor of Physics and Dean of Faculty of Science - R.F. Marsden, rmc, BSc, PhD

Professor and Head of the Department - G. Labonté, BSc, MSc, PhD

Professor - M.L. Chaudhry, BA, MA, PhD

Professor - B.J. Fugère, BSc, MSc, PhD

Professor - R. Gervais, ndc, BA, BSc, MSc, PhD

Professor - R. Godard, Lic ès Sci, Dr 3rd Cycle, PhD

Professor - P. Gravel, ndc, BMath, MMath, PhD

Professor - L.E. Haddad, Lic ès Sci, MSc, PhD

Professor - G. Isac, LSc, DSc

Professor - R.E. Johnson, BSc, MS, PhD

Professor - R.M. Shoucri, BSc, MSc, MSc, PhD, PEng

Professor - D.L. Wehlau, BSc, MA, PhD

Associate Professor - G.E. Simons, BMath, MSc, PhD

Associate Professor - S.M. Thomas, BSc, MSc, PhD

Assistant Professor - P. Baille, Lic ès Sci, Dr 3rd Cycle, PhD

Assistant Professor - D. Kelly, BSc, BEd, MEng, PhD

Assistant Professor - Y. Liang, BSc, MSc, PhD

Assistant Professor - B.G. Ong, BSc, SM, PhD, PEng

Assistant Professor - D. Rinfret, BMath, PhD

Assistant Professor - C. Tardif, BSc, MSc, PhD

Lecturer - Major L. Massey, BSc, MSc

Lecturer - Capt A. Gosselin, BSc, MSc

Courses of Study

Programmes

Our department offers the following programmes:

- BSc with Honours in Mathematics or Computer Science.
- BSc with a Major in Mathematics or Computer Science.

Furthermore, it is possible to combine two Majors in Science as described in the general regulations at the beginning of the calendar. Programmes of combined Majors in Computer Science or Mathematics with many of the Arts disciplines also exist. They are, however, often difficult to realize because of timetabling constraints. The programme in Computer Science and Administration is an exception in that the timetable is built to accommodate it.

General Requirements

All of our programmes require the Science or Engineering first year and the following mandatory Core Courses:

- HIE207A, HIE203B, HIE271B, POE205B, PSE301A, POE316A, PSE401.

Honours Mathematics

10 credits corresponding to the courses:

- MAE222A or MAE226A (or (MAE223b or MAE227B) with permission of the department), MAE209B, MAE229A, MAE304A/B, MAE305, MAE310A/B, MAE404.

9 credits corresponding to courses selected among:

- MAE234A/B, MAE236A/B, MAE331A/B, MAE333, MAE334A/B, MAE340A/B, MAE352A/B, MAE354A/B, MAE374A/B, MAE413A/B, MAE451A/B, MAE456A/B.

1 credit in Computer Science corresponding to CSE350A/B,

1 credit in Computer Science corresponding to a course selected among:

- CSE301A/B, CSE321A/B, CSE323A/B, and

4 credits corresponding to elective in Science or Engineering or, with the permission of the department, courses from the Arts departments.

Honours Computer Science

13 credits corresponding to the courses of the following list:

List 1:

- MAE209B, EEE245A, CSE321A/B, EEE321A/B, MAE333B, CSE341B, CSE350A, EEE351A, CSE362A/B, CSE390A/B, EEE435A, EEE466A, CSE472A/B.

3 credits in Mathematics corresponding to:

- MAE222A or MAE226A (or (MAE223B or MAE227B)) and MAE229A.

3 credits in Business Administration corresponding to:

- BAE344B, BAE410A, and BAE432A.

6 credits corresponding to courses at a level equal or greater to 200 from the Department of Mathematics and Computer Science or that of Computer Engineering except those destined to Arts students and, with the approval of the department, certain courses given by other departments.

Major Mathematics

7 credits of Mathematics corresponding to:

- MAE222A or MAE226A (or (MAE223B or MAE227B)), MAE209B, MAE229A, MAE304A/B, MAE305, and

5 other credits, corresponding to Mathematics courses selected among those given by the department (with the exclusion of the courses destined to the Arts students).

Major Computer Science

7 credits corresponding to:

- EEE245A, CSE321A/B, EEE321A/B, MAE333B, CSE341B, CSE350A, EEE351A.

2 other credits corresponding to courses selected from List 1 specified above for the Honours program, or one credit from that list plus MAE229A/B.

3 credits corresponding to courses selected from the above List 1, or from the other computer science courses given by the department (except those destined to the Arts students), or the Mathematics courses MAE234A/B and MAE334A/B, or from the following list of Computer Engineering courses:

- EEE243B, EEE307B, EEE361B, EEE431B, EEE459A, EEE461A, EEE469A, EEE473B, EEE492A, EEE499B.

Note: Other courses could be substituted to these with the permission of the department.

Combined Major Computer Science & Mathematics

The courses required for the double Majors are all the courses required for the individual Majors. Certain courses could count toward the two programmes.

We note that the combined majors program can lead to an Honours BSc when the conditions described at the beginning of the present calendar are satisfied.

Combined Major Computer Science and Business Administration

Courses required by the Department of Mathematics and Computer Science

- MAE209B, EEE245A, CSE321A/B, EEE321B, MAE333B, CSE350A, CSE341B, EEE351A.

3 additional credits selected among the courses listed above as accepted for the Major in Computer Science.

In this programme, BAE410A/B is considered acceptable as a Computer Science course.

The courses required by the Department of Business Administration are all the courses in their Major in Administration except for BAE220A, BAE242A and BAE450B which are not required. The first term of

ECE102 will be taken as a prerequisite to ECE224A/B.

Canadian Operational Research Society Diploma

Together with their RMC diploma, students can obtain the Canadian Operational Research Society diploma if they fulfil the following conditions.

Complete with success the following 8 courses:

- CSE101B, MAE209B or BAE242A, MAE310A/B, BAE342A, BAE344B, CSE341B, CSE453A/B, CSE472A/B or BAE410A.

Complete a project that involves the use of an Operational Research technique.

Obtain an overall average of B- or better for these 8 courses and the project.

One can obtain more information about this diploma at the Mathematics and Computer Science Department, at the Business Administration Department and at the Internet site: <http://www.cors.ca>.

Physics

Faculty

Department of Physics

Professor and Dean of Science- R.F. Marsden, rmc, BSc, PhD

Professor and Head of the Department - T.J. Racey, BSc, BEd, MSc, PhD

Professor Emeritus - D.C. Baird, BSc, PhD

Professor Emeritus - M.H. Edwards, BA, MA, PhD, NDC

Professor Emeritus - R. Favreau, BSc, MSc, PhD

Professor Emeritus - R.F. Harris-Lowe, rmc, BSc, PhD

Professor Emeritus - S.L. McBride, BSc, PhD

Professor Emeritus - D.H. Rogers, BSc, MSc, PhD

Professor Emeritus - D.E. Tilley, BSc, PhD

Professor Emeritus - R.R. Turkington, BSc, MSc, PhD

Professor Emeritus - L.S. Wright, BSc, MAT, PhD

Professor - J.R. Buckley, BSc, PhD

Professor - N. Gauthier, BA, BSc, MSc, PhD

Professor - A.R. Lachaine, BSc, MSc, PhD

Professor - B.K. Mukherjee, BSc, PhD

Professor - S. Ranganathan, ndc, BSc, MSc, MTech, PhD

Professor - P.L. Rochon, BSc, PhD, PEng

Professor - P.J. Schurer, BSc, MSc, PhD

Professor - M.W. Stacey, BSc, PhD

Associate Professor - G. Wade, BSc, MSc, PhD

Associate Professor (Adjunct) - J.R. Gosselin, BScA, PhD

Assistant Professor and Director of the Centre of Space Research - Lieutenant Commander D. Burrell, CD, BSc, MSc, PhD

Assistant Professor - Captain S. Dubois, rmc, BEng, MSc, PhD

Assistant Professor - L. Levesque, BSc, MSc, PhD

Assistant Professor - Captain A. Mac Giolla Chainnigh, CD, rmc, BEng, MSc, PhD

Assistant Professor - J.-M.A. Noël, BSc, MSc, PhD

Assistant Professor (Adjunct) - G. Yang, BSc, MSc, PhD

Lecturer - Captain S. Hurlbut, BSc, MSc

Lecturer - Major M. Labrecque, BSc, MSc

Research Associate - B. Bennett, BA, BSc, MA, PhD

Research Associate - L. Han, BSc, MSc, PhD

Research Associate - L. Levesque, BSc, MSc, PhD

Lecturer - Captain G. Sabat, BSc, MSc

Lecturer - Captain R. Vincent, BSc, MSc

Research Associate - J. Shore, BMath, PhD

Research Assistant - C. Folsom, BSc

Research Assistant - J. Power, BSc

Research Assistant - A. Rogers, BSc

Research Assistant - A. Russell, BSc, MSc

Research Assistant - J. Sigaran, BcSEng

Research Assistant - J. Silvester, BSc

Research Assistant - C. Tsui

Research Assistant - M. Welland, BSc

Research Assistant - J. Woodside

Courses of Study

First Year (Core Syllabus for Science)

First Year (Core Syllabus for Science)

Mandatory	Electives
CCE101 CSE101A ENE100 / FRF151 MAE101 MAE129B PHE104 PSE123B	

Honours Physics

	Second Year	Third Year	Fourth year
Mandatory	CCE218A HIE203B HIE207A MAE209A/B MAE222A* MAE223B* MAE229A/B PHE205A PHE207A PHE225B PHE227B POE205B *Or MAE226A / MAE227B	HIE271B MAE305 PHE302A PHE304A PHE305A PHE307B PHE331(1) PHE415B* PSE301A	MAE413A PHE403B PHE413B* PHE420 PHE451B PHE462A POE316A PSE401B
Electives		1 of PFE331(2) or PHE346B	Plus 2 (one semester) Physics courses at the 400 level

Physics Majors

	Second Year	Third Year	Fourth year
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Mandatory	HIE203B HIE207A MAE222A* MAE223B* PHE205A PHE207A PHE225B PHE227B POE205B * Or MAE226A / MAE227B	HIE271B MAE305 PHE302A PHE304A PHE305A PHE307B PHE331(1) PSE301A	PHE364B PHE401B PHE462A POE316A PSE401B
Electives	Plus, 3 (one semester) science courses at the 200 level	Plus, 2 science courses at the 300 or 400 level.	Plus, 3 science courses at the 300 or 400 level.

Honours Space Science

	Second Year	Third Year	Fourth year
Mandatory	CCE218A MAE209A/B MAE222A* MAE223B* MAE229A/B HIE203B HIE207A PHE205A PHE207A PHE225B PHE227B POE205B Or MAE226A / MAE227B	HIE271B MAE305(1) MAE331B PHE300A PHE302A PHE307B PHE331 PHE350A PHE354B PSE301A	CCE452B PHE445A PHE448 PHE450A PHE452B POE316A POE450B PSE401B
Electives		Plus, 1 course from: PHE352B**, PHE364B, PHE412A, PHE442B, PHE460B, PHE442B**	Plus, 1 one course from: PHE352B**, PHE364B, PHE412A, PHE442B**, PHE460B

Space Science Majors

	Second Year	Third Year	Fourth year
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Mandatory	HIE203B HIE207A MAE222A* MAE223B* PHE205A PHE207A PHE225B PHE227B POE205B * Or MAE226A / MAE227B	HIE271B PHE300A PHE302A PHE307B PHE331(1) PHE354B PSE301A	PHE450A PHE452B POE316A PSE401B
Electives	Plus, 3 (one semester) science courses at the 200 level	Plus, 2 (one semester) space science courses from: PHE331(2), PHE350A, PHE352B**, and 2 sciences courses at the 300 or 400 level	Plus, 4 science courses at the 300 or 400 level.

Combined Honours In Physics And Space Science

	Second Year	Third Year	Fourth year
Mandatory	CCE218A HIE203B HIE207A MAE222A* MAE223B* MAE209A/B MAE229A/B PHE205A PHE207A PHE225B PHE227B POE205B *Or MAE226A / MAE227B	HIE271B MAE305* PHE302A PHE304A PHE307B PHE331 PHE350A PHE354B PSE301A *Or MAE305(1) and MAE331B	PHE305A PHE420 or PHE448 PHE442B PHE450A PHE452B POE316A PSE401B
Electives		One course from PHE352B**, PHE442B**, PHE364B, PHE413B**	2 courses from PHE403B, PHE415B**, PHE445A, PHE451A, POE450A, CCE452B or MAE413B

Combined Majors In Physics And Space Sciences

	Second Year	Third Year	Fourth year
Mandatory	HIE203B HIE207A MAE222A* MAE223B* PHE205A PHE207A PHE225B PHE227B POE205B	HIE271B MAE305* PHE302A PHE304A PHE307B PHE354B PSE301A	PHE450A PHE452B PHE462A POE316A PSE401B

	*Or MAE226A / MAE227B	*Or MAE305(1) and MAE331B	
Electives	Plus, 3 (one semester) science courses at the 200 level.	One of PHE305A, PHE350A and one of PHE331(1), PHE352B**, PHE364B**.	4 science courses at the 300 or 400 level.

Required Physics Courses for Combined Degrees

Mandatory Physics courses for any combined Honours involving Physics

MAE222A and MAE223B (or MAE226A and MAE227B), PHE205A, PHE207A, PHE225B, PHE227B, MAE305, PHE302A, PHE304A, PHE305A, PHE462A plus one of PHE307B, PHE403B, PHE413B**, PHE460B.

Mandatory Physics courses for any combined Majors involving Physics

MAE222A and MAE223B (or MAE226A and MAE227B), PHE205A, PHE207A, PHE225B, PHE227B, MAE305, PHE302A, PHE304A, PHE305A, PHE462A plus one of PHE307B, PHE403B, PHE413B**, PHE460B.

Mandatory Space courses for any combined Honours involving Space Science

MAE222A and MAE223B (or MAE226A and MAE227B), PHE205A, PHE207A, PHE225B, PHE227B, PHE302A, PHE331A, PHE354B, PHE307B, PHE450A, PHE452B, plus one of PHE350A, PHE445A.

Mandatory Space courses for any combined Majors involving Space Science

MAE222A and MAE223B (or MAE226A and MAE227B), PHE205A, PHE207A, PHE225B, PHE227B, PHE302A, PHE331A, PHE354B, PHE307B, PHE450A, PHE452B, plus one of PHE350A, PHE445A

Physics Minor

Students must complete the First Year in science and complete PHE205A and PHE207A and PHE207A. Plus, 3 (one semester) courses from the Physics Programme (or Space Science Programme) at the 200, 300, or 400 level.

General notes on Physics Programmes

** (indicates course is offered in alternate years.)

The department will consider equivalent Physics substitutions at the 300 and 400 level, for the combined Physics and Space Science programmes on a case-by-case basis.

Combined Honours and Majors programmes are also available in:

- Physics/Computer Science,
- Physics/ Chemistry,
- Space Science/ Mathematics,
- Space science/Computer Science and,

- Space Science/ Chemistry.

The Physics and the Joint department should be consulted for details.

In any combined Honours or Majors programme, whenever the same two term course is required by both departments, one term will normally be counted towards the requirements of each department. The Heads of the relevant departments should be consulted for further clarification.

Table of Co-Requisites / Prerequisites

Course	Co-Requisites	Prerequisites
PHE104 General Physics	MAE101	
PHE202B Elementary Physics		
PHE205A Mechanics	MAE203	MAE101, PHE104
PHE207A Electricity and Magnetism		MAE101, PHE104
PHE225B Modern Physics	MAE203	PHE205A
PHE226B Modern Physics	MAE203	PHE205A
PHE227B Electromagnetism	MAE203	PHE207A
PHE229B Electromagnetism (for electrical and computer engineering students)	MAE203	PHE104
PHE300A Modern Physics	MAE305 / 330B	PHE205A, PHE225B, PHE227B
PHE302 Electromagnetic Waves	MAE305 / 330B	MAE203, PHE227B
PHE303B Statistical and Thermal Physics	MAE305 / 330B	MAE203, PHE304A
PHE304A Quantum Mechanics	MAE305 / 330B	MAE203, PHE225B
PHE305A Classical Mechanics	MAE305 / 330B	MAE203, PHE205A
PHE331 Instrumentation		PHE104
PHE352B Astronomy	MAE203, PHE104	FYB
PHE354B Space Systems		PHE104
PHE360 Astronomy and the Evolving Universe (Arts elective)		
PHE364B Physics Laboratory		PHE104
PHE403A Solid State Physics	MAE305 / 330B	PHE300A or PHE304A
PHE407A Optics	MAE305 / 330B	PHE302A
PHE412A Advanced Electromagnetic Theory	MAE305 / 330B	PHE302A
PHE413B Nuclear Physics	MAE305 / 330B	PHE304A
PHE415B Advanced Quantum Mechanics	MAE305 / 330B	PHE304A
PHE420 Senior project		Honours
PHE442B Introduction to Astrophysics		PHE300A or equivalent
PHE445A Physics of the Space Environment		PHE302A, PHE303B
PHE448 Spacecraft Mission Analysis and Design		FYB
PHE450A Space Communication and Navigation		FYB
PHE451B Senior Physics Laboratory		
PHE452B Remote Sensing	MAE305 / 330B	PHE302A, PHE407A
PHE460B Computational Physics		PHE302A, PHE303B, PHE304A

Note: FYB - First year basic: MAE101, PHE104

Chemistry & Chemical Engineering

Faculty

Department of Chemistry and Chemical Engineering

Professor and Head of the Department - K.A.M. Creber, BSc, MSc, PhD

Professor Emeritus - M.J.B. Evans, BSc, PhD, CChem, FRSC.

Professor Emeritus - R.F. Mann, rmc, BSc, MSc, PhD, FCIC, PEng.

Professor - J.C. Amphlett, BSc, PhD.

Professor and Professor-in-Charge of the Chemical Engineering Programme - P.J. Bates, BSc, MEng, PhD, PEng.

Professor - L.G.I. Bennett, CD, rmc, BEng, MASc, PhD, PEng.

Professor - H.W. Bonin, BA, BSc, BScA, MIng, PhD, ing, PEng, FCIC, FCNS.

Professor - V.T. Bui, BScA, MScA, PhD.

Professor - J.P. Laplante, BSc, MSc, PhD

Professor - B.J. Lewis, BSc, MEng, PhD, PEng.

Professor - K.J. Reimer, BSc, MSc, PhD, FCIC.

Professor - P.R. Roberge, BA, BSc, MChA, PhD.

Professor - W.T. Thompson, BASc, MASc, PhD, PEng.

Professor - G.M. Torrie, BSc, MSc, PhD.

Professor and Acting Dean of Graduate Studies and Research, - R.D. Weir, CD, BSc, DIC, PhD, FCIC, FEIC, FIUPAC, FRSC, CChem, PEng.

Professor (Adjunct) - W.R. Cullen, MSc, PhD.

Professor (Adjunct) - D.E.G. Jones, BSc, PhD.

Associate Professor - W.S. Andrews, CD, rmc, BEng, MEng, PhD, PEng.

Associate Professor - B.A. Peppley, BASc, BEd, MSc, PhD.

Associate Professor - B.A. Zeeb, BSc, PhD.

Associate Professor (Adjunct) - W.J. Lewis, CD, rmc, BEng, MBA, MEng, BEd, MEd, PhD.

Associate Professor (Adjunct) - S. Liang, BSc, MSc, PhD.

Associate Professor (Adjunct) - W.W. Mohn, BA, PhD.

Associate Professor (Adjunct) - E.J. Waller, BSc, MScE, PhD.

Assistant Professor - N. Cunningham, B.Eng, M.Sc., PhD.

Assistant Professor - G.L.P. Lord, BA, BSc, MSc, PhD.

Assistant Professor - J.Y.S.D. Pagé, CD, rmc, BEng, MEng, PEng, PhD.

Assistant Professor - C. Thurgood, BSc, MSc, PhD.

Assistant Professor - J. Wojtyk, BSc, PhD.

Assistant Professor (Adjunct) - E. Cooper, BSc, PhD.

Assistant Professor (Adjunct) - K.M. Jaansalu, CD, rmc, BEng, MEng, PhD.

Assistant Professor (Adjunct) - I. Koch, BSc, PhD.

Assistant Professor (Adjunct) - C. Ollson, BSc, MSc, PhD.

Assistant Professor (Adjunct) - R. Rao, BSc, MSc, PhD.

Assistant Professor (Adjunct) - A. Rutter, BSc, MSc, PhD.

Lecturer - Lieutenant (N) P. Busatta, BEng, MASc, rmc.

Lecturer - Captain D. Couzens, BEng, MASc, rmc.

Lecturer - Captain P.E. Poirier, CD, BEng, MEng, Eng.

Lecturer - Captain L.A. Wendland, CD, BEng, MASc, rmc.

Defence Scientist - E.F.G. Dickson, BSc, PhD.

Defence Scientist - D.G. Kelly, BSc, PhD.

Director Slowpoke Facility - K. Nielsen, BSc, MSc.

ESG Program Manager - D.A.Reimer, BScH.

Radiation Safety Officer - D. Ferguson, Chem Eng Tech.

Research Associate - F. Akbari, BSc, MSc, PhD.

Research Associate - P. Bodurtha, BSc, MSc, PhD.

Research Associate - R. Goyan, BSc, PhD.

Research Associate - R.D. Klassen, BSc, BEng, PhD.

Research Associate - D. Loock, PhD.

Research Associate - A. Qi, BSc, MSc, PhD.

Research Associate - Y. Wan, BSc, PhD

Chemical Engineering Committee

Chair

P.J. Bates, BSc, MSc, PhD, PEng, Professor & Professor-in-Charge, Chemical Engineering.

Members

W.S. Andrews, CD, rmc, BEng, MEng, PhD, PEng - Associate Professor

L.G.I. Bennett, CD, rmc, BEng, MAsC, PhD, PEng - Professor

H.W. Bonin, BA, BSc, BScA, MIng, PhD, ing, PEng, FCIC, FCNS - Professor

K.A.M. Creber, BSc, MSc, PhD - Professor and Head of Department.

B.J. Lewis, BSc, MEng, PhD, PEng - Professor

W.T. Thompson, BASc, MAsC, PhD, PEng - Professor

R.D. Weir, CD, BSc, DIC, PhD, FCIC, CChem, FRSC, PEng - Professor

The Chemical Engineering Committee is responsible to the Dean of Engineering for the curriculum of the Chemical Engineering programme, for its engineering accreditation, and for representing and protecting the interests of the students enrolled in the programme. It reports, through the Head of Department, to the Dean of Engineering.

Accreditation

General Information

The baccalaureate degree programme in Chemical Engineering is accredited by the Canadian Engineering Accreditation Board of the Canadian Council of Professional Engineers, and is recognized by the Chemical Institute of Canada and the Canadian Society for Chemical Engineering as qualifying its graduates for full membership status.

Courses of Study

Introduction

The Department of Chemistry and Chemical Engineering offers courses of study leading to the degrees of Bachelor of Engineering in Chemical Engineering, and Bachelor of Science Chemistry at the Honours, Major or General levels.

The Chemical Engineering program has a strong Materials Engineering component. Nuclear and Environmental Engineering are also included to reflect the spectrum of chemical engineering interests of

value to the Canadian Forces and the Department of National Defence. In addition to the basic chemical engineering core, the program emphasises the areas of corrosion, fuel cells, batteries, alloys, polymers, ceramics, composite development, explosives, combustion processes, nuclear energy applications and environmental stewardship. All these areas highlight the unique nature of the Chemical Engineering Degree at RMC.

The Chemical Engineering degree programme is headed by a Professor-in-Charge, who reports to the Dean of Engineering through the Head of Department. The programme is administered by the Chemical Engineering Committee, of which the Professor-in-Charge is Chair.

First Year

Mandatory

- CCE101
- CSE101B
- ENE100
- MAE101
- MAE129A
- PHE104
- PSE123B

To enter the Second Year Honours programme Chemistry, a "B-" combined average in Chemistry, Mathematics and Physics in the First Year Engineering or Science programme is normally required.

To enter the Second Year programme in Chemical Engineering, students must have completed successfully the First Year Engineering or Science programme, normally with a minimum "D+" combined average in Chemistry, Mathematics and Physics and have the approval of the Department of Chemistry and Chemical Engineering.

Chemistry Honours

	Second Year	Third Year	Fourth Year
Mandatory	CCE218A		
	CCE240B	CCE308A	
	CCE241	CCE309B	
	HIE203B	CCE342B	CCE441A
	HIE207A	CCE343B	3 additional 300 or 400 level Chemistry courses
	MAE222A or MAE226A	CCE385A	POE316A
	MAE223B or MAE227B	2 additional 300 or 400 level Chemistry courses	PSE401B
	MAE229A	HIE271B	SCE420
	PHE207A	PSE301A	
	POE205B		

Elective(s)		2 Science or Engineering courses	4 Science or Engineering courses
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Chemistry Major

	Second Year	Third Year	Fourth Year
Mandatory	CCE218A CCE240B CCE241 HIE203B HIE207A MAE226A or MAE222A MAE227B or MAE223B POE205B	CCE308A CCE342B CCE343B CCE385A 1 additional Chemistry course at the 300 or 400 level HIE271B PSE301A	CCE441A 2 additional Chemistry courses at the 300 or 400 level POE316A PSE401B
Elective(s)	2 of: MAE209B MAE229A PHE207A PHE226B*	4 Science or Engineering electives	5 Science or Engineering electives

*Chemistry Majors are strongly encouraged to select PHE226B in order to maximise their choices in Third and Fourth years.

Combined Majors

Chemistry Program (Combined with Physics or Space Science)

	Second Year	Third and Fourth Year
Mandatory	CCE218A CCE241 HIE203B HIE207A MAE222A or MAE226A MAE223B or MAE227B POE205B	CCE308A CCE309B CCE342B CCE343B CCE451A 3 additional Chemistry courses at the 300 or 400 level HIE271B POE316A PSE301A

	PSE401B
Second Major	Those courses required by the department of Physics for the Combined Major.

Chemistry Program (Combined with Programs other than Physics or Space Science)

	Second Year	Third Year and Fourth Year
Mandatory	CCE218A CCE240B CCE241 HIE203B HIE207A MAE209B MAE222A or MAE226A MAE223B or MAE227B POE205B	CCE308A CCE342B CCE343B CCE385A 2 additional Chemistry courses at the 300 or 400 level HIE271B POE316A PSE301A PSE401B
Second Major	Those courses required by the department offering the second Major.	

Chemistry Minor

- CCE101
- CCE217A, CCE240B
- Plus 6 electives from the courses listed under Honours Chemistry

Chemical Engineering Program

The prescribed course of study for students taking Chemical Engineering is set out in the tables under "Course Outlines" as follows:

First Year	Table 3
Second Year	Table 8
Third Year	Table 15
Fourth Year	Table 24
Requirements for Other Programs	

For students taking Arts

- CCE106A (See [Table 5](#))
- CCE200A, CCE360A, CCE362A, CCE364B, CCE366B (Electives)

For students taking Engineering (other than Chemical Engineering)

- CCE101
- CCE217A, CCE220A

For students taking General Science:

- CCE101
- CCE217A, CCE240B
- Plus 6 electives from the courses listed under Honours Chemistry

Laboratories & Equipment**Departmental Laboratories**

The departmental laboratories are located in the Sawyer Building, Modules 4 and 5. They are equipped for teaching and research in the areas of chemistry, materials science, environmental sciences, chemical and materials engineering, environmental engineering as well as nuclear engineering relevant to the course of study and to defence interests. More specifically, they include the following:

Materials Science And Engineering

Materials selection for engineering applications and determination of the chemical, physical and mechanical properties are the foci of study. High temperature furnaces are used in the preparation and treatment of metals, alloys and ceramics while an injection molder is among the tools employed in the area of polymer blends and with composites. Atomic absorption, IR, FTIR, and NMR spectrometers together with gas and liquid chromatography, gel permeation chromatography and viscometry are used in chemical analysis. X-ray diffraction, scanning electron microscopy, metallurgical and polarised-light microscopy, hardness, shear and tensile testing are used to determine physical properties. The various materials are also characterized by thermal gravimetry, by adiabatic and differential scanning calorimetry, by differential thermal analyses, by polarography and Karl Fischer titration.

Chemical Engineering

The chemical conversion of natural or synthetic materials into useful engineering products together with their management and maintenance are the foci of these studies. Various experiments, some of which are computer controlled, are performed in heat and mass transfer, which include the use of a bubble cap distillation tower, ion exchange and gas absorption columns, flame propagation and stability apparatus. Chemical reactions are studied using flow tank reactors, and a continuous combustion furnace, which also serves to characterize gaseous and liquid fuels. Rates of corrosion are determined under various environmental conditions. A bench-scale heat pump provides a study in applied thermodynamics.

Nuclear Science And Engineering

The main tool for nuclear studies is the SLOWPOKE-2 research reactor, which is operated by this Department for the Department of National Defence. Experiments include neutron activation analysis, neutron radiography and isotope production applied to various military problems. Related experiments deal with health physics, radiation protection, liquid scintillation counting, reactor physics and thermal hydraulic studies. The SLOWPOKE-2 Facility serves professors, students, researchers and technical trainees, and provides other capabilities such as radiation detection and low-level counting.

Computer Resources

A variety of IBM compatible microcomputers are available within the Department to support our students. Various software packages including:

- FORTRAN,
- HYSIM,
- DIRA,
- FEMLAB,
- LABVIEW and
- CODAS

are used to automate and simulate chemical processes.

Civil Engineering

Faculty

Department of Civil Engineering

Professor Emeritus - J.S. Ellis, BSc, MEng, PhD, PEng.

Professor and Head of the Department - J.H.P. Quenneville, rmc, BEng, MEng, PhD, PEng.

Professor and Dean of Engineering - J.A. Stewart, CD, rmc, BEng, MAsc, PhD, PEng.

Professor - G. Akhras, DipIng, MScA, PhD, PEng, FCSCE, FASCE, FEIC

Professor - R.J. Bathurst, BSc, MSc, PhD, PEng, FEIC, FCAE.

Professor (Adjunct) - R.P. Chapuis, BEng, DEA, DScA, PEng, FEIC.

Professor - M.A. Erki, BAsC, MAsc, PhD, PEng, FIIFC, FIABSE, FCSCE.

Associate Professor - D. Chenaf, BEng, MScA, PhD.

Associate Professor - Major R.G. Wight, CD, rmc, BEng, MEng, PhD.

Associate Professor (Adjunct) - M. Green, BSc, PhD, PEng.

Associate Professor (Adjunct) - C.W. Greer, BSc, PhD.

Associate Professor (Adjunct) - R. Tanovic, BSc, MSc, PhD, PEng.

Associate Professor (Adjunct) - S. Tighe, BSc, MAsc, PhD, PEng.

Assistant Professor - J.A. Héroux, BEng, MIng, PEng.

Assistant Professor - P. Lamarche, BAsC, MAsc, PhD, PEng.

Assistant Professor - M. Tétreault, BIng, MScA, PhD, PEng.

Assistant Professor - Captain N. Vlachopoulos, CD, rmc, BEng, MEng, PhD Candidate, PEng.

Lecturer - Captain M.C.G. Lehoux, CD, BEng, MAsc.

Lecturer - Captain M.W. Rancourt, CD, BEng, MEng.

Technical Officer - D.A. Young, CET.

Accreditation

Accreditation

The baccalaureate degree programme in Civil Engineering is accredited by the Canadian Engineering Accreditation Board of the Canadian Council of Professional Engineers.

Courses of Study

Courses Of Study

The prescribed course of study for students taking Civil Engineering is set out in the tables under "Course Outlines" as follows:

First Year

[Table 3](#)

Second Year

[Table 9](#)

Third Year

[Table 16](#)

Fourth Year

[Table 25](#)

Students should review the course descriptions to verify if they have the required prerequisites to enrol in a given course. Students must have the required prerequisites or the approbation of the department.

Laboratories & Equipment

Laboratories And Equipment

The laboratory experiments and exercises are designed to provide the students with practical experience in handling field, office and laboratory equipment used in the civil engineering profession.

The teaching laboratories provide equipment to permit groups of three or four students to conduct experiments in structural engineering, soil mechanics, pavement materials, asphalt technology, hydrology, water supply, wastewater treatment, and environmental engineering; and to conduct exercises in surveying, photogrammetry and traffic engineering.

The Department's equipment includes:

Structural Engineering

Six electronic data acquisition systems with PC's; MTS loading system with 1000 kN, 500 kN, 2 @ 250 kN, 100 kN and 50 kN capacity pistons; various reaction frames including one 1000 kN 4 column load reaction frame; numerous universal testing machines of 900 kN, 600 kN, 250 kN and 100 kN capacities and one 810 MTS 250 kN unit; one impact tester, four bench torsion testing instruments; three bench tension testing instruments; one electric concrete mixer; one screening plant; one vibrating table; one 1350 kN concrete cylinder testing machine; two environment-controlled rooms.

Geotechnical Engineering

Soil testing drive rods and sampling spoons; Atterberg limit testing devices; sieves, hydrometers, and specific gravity apparatus; standard and modified Proctor compaction apparatus; Harvard miniature compaction apparatus; CBR equipment; consolidometers; unconfined, direct shear and triaxial test apparatus; seismic refraction surveying apparatus; computerized electronic data acquisition systems; temperature & humidity controlled chamber; rigid and flexible wall permeaters; pressure plate and pressure membrane extractors; 50,000 kg shaking table.

Transportation Engineering

Apparatus for solubility, specific gravity, flash point, penetration, distillation, viscosity and ductility tests for bituminous materials, Marshall asphalt test equipment. Los Angeles abrasion machine, polished stone value machine, portable skid-resistance tester and extensive equipment for testing road aggregates. Traffic counters and associated equipment.

Environmental Engineering

Instruments to determine water pH, turbidity, colour, specific ion concentration and bacteriological quality; balances; instruments for pollution studies including colorimetric and spectrophotometric devices; apparatus for wastewater analysis including BOD, COD, nutrient enrichment and toxicity, temperature controlled rooms; atomic absorption spectrophotometer with flame and furnace for trace metals analysis; TOC analyser; two ion chromatographs; three gas chromatographs, mass selective detector, to scan samples for organic contamination; neutron activation for metal analysis. Instruments to study pipe flow, open channel flow, ground water flow and hydrological phenomena. Laboratory and field equipment for vadose zone and groundwater investigations. Laboratory and field equipment for surface water quality and ecological studies. A mobile laboratory equipped with a gas chromatograph with mass selective detector, a drying oven, a centrifuge, class "A" fume hoods and various field testing equipment.

Geomatics

Real-time and post-analytical differential GPS receiver equipment; total station, electronic and optical surveying equipment; photogrammetric stereoscopes and parallax measurement equipment.

Electrical & Computer Engineering

Faculty

Department of Electrical and Computer Engineering

Associate Professor and Head of the Department - D.Bouchard, CD, rmc, BEng, MEng, PhD, PEng

Professor Emeritus - J.D. Wilson, BSc, PhD, PEng

Professor - D. Al-Khalili, BSc, MSc, PhD, PEng

Professor - P.E. Allard, BSc, BASc, MSc, PhD, FEIC, PEng

Professor - Y.M.M. Antar, BSc, MSc, PhD

Professor - M. Farooq, BScEng, MTech, PhD, PEng.

Professor - C.N. Rozon, BSc, MSc, PhD, PEng

Professor - C.D. Shepard, BSc, MA, PhD, PEng

Professor (Adjunct) - Y.T. Chan, BSc, MSc, PhD, PEng

Professor (Adjunct) - P. Langlois, BEng, MEng, PhD

Professor (Adjunct) - J. Plant, OMM, CD, mde, Phd(MIT),FEIC, FIEEE, PEng

Associate Professor - S. Amari, DES, MSEE, PhD

Associate Professor - F. Chan, BEng, MScA, PhD

Associate Professor - G. Drolet, BSc, MSc, PhD, PEng

Associate Professor - G.S. Knight, CD, rmc, BEng, MEng, PhD, PEng

Associate Professor - D. McGaughey, BSc, MSc, PEng, PhD

Associate Professor - M.H. Rahman, BSc, MSc, PhD, PEng

Associate Professor - M. Tarbouchi, BSc, MSc, PhD

Associate Professor (Adjunct) - C.W. Trueman, BEng, MEng, PhD

Assistant Professor - J. Bray, BAsC, MASc, PhD

Assistant Professor - N. Chabini, BSc, MSc, PhD

Assistant Professor (Adjunct) - T. Dean, BSc, MSc, PhD

Assistant Professor - M. Hefnawi, BSc, MSc, PhD

Assistant Professor - F.A.Okou, BIng, MIng, PhD

Assistant Professor (Adjunct) - R. Inkol, BSc, MASc

Assistant Professor (Adjunct) - S. Knap

Assistant Professor - Major J.P.S. Leblanc, CD, cmr, plsc, BSc, MEng, PEng

Assistant Professor (Adjunct) - G.A. Morin

Assistant Professor - A.M. Noureldin, BSc, MSc, PhD

Assistant Professor - W.G. Phillips, CD, rmc, BEng, MEng, PEng

Assistant Professor - Major R. Smith, CD, rmc, BEng, MSc

Assistant Professor - Maj (Retired) C.M. Wortley, CD, BEng, MEng, PEng

Lecturer - Maj A. Beaulieu, CD, BEng, MEng, PEng

Lecturer - Maj J.C. Bronson, CD, BEng, MEng, PEng

Lecturer - Capt J. Dunfield, CD, rmc, BEng

Lecturer - Capt G. Gilbert, CD

Lecturer - Capt M.W.P. LeSavage, BEng, MASc

Lecturer - Maj J.W. Paul, BSc

Technical Officer - P. Adam

Research Assistant - H. Lee, BEng

Research Assistant - H. Sun, BSc, MSc, PhD

Accreditation

Accreditation

The baccalaureate degree programmes in Electrical Engineering and Computer Engineering are accredited by the Canadian Engineering Accreditation Board of the Canadian Council of Professional Engineers.

Courses of Study

Electrical Engineering

The prescribed course of study for students taking Electrical Engineering is set out in the tables under Course Outlines as follows:

First Year

[Table 3](#)

Second Year

[Table 10](#)

Third Year

[Table 18](#)

Fourth Year

[Table 27](#)

Note: Any Second Year course pattern in Engineering is acceptable for admission to Third Year Electrical Engineering provided the requisite standing in Chemistry, Mathematics and Physics is obtained (see Academic Regulation 15).

Computer Engineering

The prescribed course of study for students taking Computer Engineering is set out in the tables under "Course Outlines" as follows:

First Year

[Table 3](#)

Second Year

[Table 10](#)

Third Year

[Table 17](#)

Fourth Year

[Table 26](#)

Note: Any Second-Year course pattern in Engineering is acceptable for admission to Third Year Computer Engineering, provided the requisite standing in Chemistry, Mathematics and Physics is obtained (see Academic Regulation 15).

Laboratories & Equipment

General Information

The laboratories and offices of the department are located on the third, fourth and fifth floors of Modules 1 and 2 of the Sawyer Building (Building 69).

The department has a number of modern, well-equipped laboratories which permit the students to supplement their theoretical knowledge with practical experience. They allow the students to conduct experiments in electronics, communications and microwaves, energy conversion and machines,

automatic control and robotics, analog simulation, microcomputers, computer networks and operating systems, 3-D graphics, VLSI system design and digital signal processing.

In addition, research rooms and facilities are provided for staff and post-graduate research. The principal research areas of the department are Communications and Microwaves, Automatic Control and Robotics, Power, Microprocessor applications and Embedded Computer systems, VLSI, Software Engineering and Real-Time Operating systems, with emphasis on applicability to the needs of the Canadian Armed Forces.

Mechanical Engineering

Faculty

Department of Mechanical Engineering

Professor Emeritus - P. Bussi res, CD, rmc, BEng, MEng, PhD, PEng

Professor Emeritus - W.E. Eder, Ing, MASc, PEng

Professor Emeritus - W.C. Moffatt, rmc, ndc, BSc, BSc, MSc, ScD, PEng

Professor Emeritus - J.G. Pike, rmc, BSc, MSc, PhD

Professor and Dean of the Division of Continuing Studies - M.F. Bardon, rmc, BEng, PhD, PEng

Head of Department and Chief of Staff of the Division of Continuing Studies - Colonel (Retired) J.G. Lindsay, OMM, CD, rmc, plsc, qtc, pcsc, ltsc, BEng

Professor and Academic Associate Head of Department - D.L. DuQuesnay, BASc, MASc, PhD, PEng

Professor - S.H. Benabdallah, BEng, MScA, PhD, PEng

Professor (Adjunct) - E.J. Fjarlie, BASc, MASc, PhD, PEng

Associate Professor - A. Bena ssa, BSc, MSc, PhD, PEng

Associate Professor - I.E. Boros, Dipl Ing, MASc, PhD, PEng

Associate Professor - D.R. Hamilton, CD, rmc, BEng, BS, MSME, PhD, PEng

Associate Professor - P.J. Heffernan, CD, rmc, plsc, BEng, MASc, PhD, PEng

Associate Professor - D.C.M. Poir l, CD, rmc, BEng, MEng, PhD, PEng.

Assistant Professor - Lieutenant Colonel W.D.E. Allan, CD, rmc, BEng, MASc, DPhil, oxon, QFTE, PEng

Assistant Professor - A. Asghar, BEng, MASc, PhD

Assistant Professor - M. LaViolette, BScA, PhD, PEng

Assistant Professor (Adjunct) and Research Associate - P.R. Underhill, BSc, PhD

Lecturer - Captain R.R.J. Cyr, CD, rmc, BEng, , PEng.

Lecturer - Captain M.R. Strawson, rmc, BEng.

Research Engineer - G. Pucher, BAsC, PEng

Research Engineer - G. Wang, BE, ME

Research Assistant - D. Fisher, BA

Accreditation

Accreditation

The baccalaureate degree programme in Mechanical Engineering is accredited by the Canadian Engineering Accreditation Board of the Canadian Council of Professional Engineers.

Course of Study

Mechanical Engineering

The prescribed course of study for Mechanical Engineering is set out in the Course Outlines as follows:

First Year

[Table 3](#)

Second Year

[Table 11](#)

Third Year

[Table 19](#)

Fourth Year

[Table 28](#)

Aeronautical Engineering

The prescribed course of study for Aeronautical Engineering is set out in the Course Outlines as follows:

First Year

[Table 3](#)

Second Year

[Table 11](#)

Third Year

[Table 20](#)

Fourth Year

[Table 29](#)

Laboratories & Equipment

Laboratories and Equipment

The department has a number of modern, well-equipped laboratories that permit students to supplement their theoretical knowledge with practical experience. These include major installations for the study of Heat Engines, Fluid Mechanics, Materials Science, Computer-Aided Drawing, Computer-Aided Design and Manufacture, Dynamics, Heat Transfer, Control Systems and Jet Propulsion. The department operates a large teaching and research machine shop.

In addition, research facilities are available for faculty and graduate student study in the areas of combustion processes, turbomachinery, aerodynamics, fluid mechanics, aeroelasticity, structural dynamics, reciprocating engine performance, alternative fuels, composite materials, fatigue and fracture mechanics, tribology, structures, anemometry and robotics.

Language Centre

Faculty

Language Centre

S.E. ABBOTT, BComm (Caire), DipEd (Ain Chams), DEF, DSEF (Paris), DDMA (McGill), BA, MA (Waterloo), MA (RMC), MTS (Queen's), ThD, Language Teacher

E. BÉDROSSIAN, BA, MA (Ottawa) - Senior Teacher.

R.L.G. CHARETTE, BA, BEd (Ottawa), MEd (Queen's) - Language Teacher.

D. CLÉROUX, BA (Queen's) - Language Teacher.

R. CORMIER, BA (Concordia), B.En. (UQAM), MEd (Montreal) - Language Teacher.

K. DOYLE, BA (WLU), BEd (Toronto) - Resource Coordinator.

T. KANG, Bac (Avesne), BA (Lille) Language Teacher.

E. LABONTÉ, BA (Queen's) - Language Teacher.

D. LAUZON, Language Teacher.

LIEUTENANT-COLONEL J.E.J. LORD, CD, plsc, pcsc, BSc (CMR), MSc (Cranfield) - Assistant Professor of Chemistry and Chemical Engineering, Director Language Centre.

R. PAQUET, BA, MA (Laval) - Language Teacher.

J. ROUX, BA, Spéc (Lettres) (Algiers), LèsL (Montreal) - Language Teacher.

M. SÉGUIN, BA (Concordia) - Language Teacher.

N. SHIRINIAN, BA (Carleton), BEd (Toronto), MA (Queen's) - Language Teacher.

G. TOUSSAINT, BASpéc(Soc), BA (Esp) (Ottawa), Cert Ant (Haiti) - Senior Teacher.

L. TRAHAN, BA SpecL (Montreal) - Language Teacher.

E. WARD, LèsL (Damas), MA (Queen's) - Language Teacher.

Aim

Language Centre

As stated under "Second Language Training" in the general information section of this calendar where the policy concerning second language training is explained, all students who do not achieve the "exemption" level of bilingualism on initial testing are required to take second language training.

The aim of the Language Centre is to enable students to function well in their second language as officers of the Canadian Armed Forces.

Every effort is made to ensure that students become bilingual in the shortest possible time. Classes are small, usually composed of eight students. Five periods, each lasting 50 minutes, are timetabled for each week of the academic year. The learning process is given a practical aspect by the frequent use of visual aids, including video recordings. Classroom activities are designed to promote a high level of

participation by the student. Students who have not reached the "exemption" level by the end of their second year take an intensive summer course of 250 hours.

Students who have not reached the "exemption" level are tested at the end of each academic year and the summer course to determine whether they have achieved a satisfactory rate of progress and to indicate their actual level.

Athletics

Faculty

Department of Athletics (Athletic Component)

Director of Athletics - Mr. D. Cates, BKin, MA

Varsity Manager - Mr. G. Dubé, BComm (SPAD)

Physical Education Manager - Ms. N. Tremblay, BSc

Recreation and Intramural Manager - Ms. C. Powers, BSc Kin

General Information

CACAC Terms of Reference

The Commandant's Athletic Component Advisory Council (CACAC) will meet on an as required basis, normally once or twice a year, to provide a broad range of advice and support to the Commandant on strategic issues concerning the Athletic Component.

The Council should advise the Commandant on all aspects of the Athletic program, including physical education, supplementary physical training, fitness evaluations, intramural, recreation and varsity. Other subjects of importance will be reviewed and can include issues related to strategic planning, facilities, funding, staffing, and the effective integration of the Athletic Component with other aspects of the College program

Mission

As an integrated part of the Royal Military College, the Athletic Department supports the mission of RMC by providing operationally oriented physical education, competitive intramural sports, varsity and recreational club programs for officer-cadets. These programs provide extensive leadership development opportunities in an atmosphere that helps instill the values of the Canadian Forces, the College and the Department. This is achieved through mandatory Cadet involvement in physically and mentally challenging activities.

Vision

The Athletic Component of the Royal Military College will provide programs of excellence that contribute to the development of outstanding leaders for the CF who value physically active and healthy lifestyles. These programs will enhance the national reputation and profile of the College and help attract outstanding athletes.

Values

- **Loyalty** - to your team and/or squadron including obedience of superiors, e.g., coaches and team captains. Loyalty should always be upward first.
- **Integrity** - hinges on consistently giving precedence to ethical values in our decisions and

actions.

- **Courage** - Physical courage is a self-evident requirement for contact sports. Moral courage, related to integrity, is also necessary.
- **Diligence** - Persistence, hard work, meticulous attention to detail and perfection of athletic skills all describe diligence in the athletic context.
- **Fairness** - implies treating people, groups and situations justly, equitably, and without bias.
- **Responsibility** - is the ethical obligation that exercises and maintains integrity. Responsibility implies an obligation to be accountable, competent, and caring.
- **Excellence** - the desire to pursue excellence is fundamental to being an outstanding leader and officer.
- **Physically Active and Healthy Lifestyle** - to maintain a good personal level of physical fitness and a healthy body.
- **Perseverance** - striving to finish and/or to win against seemingly insurmountable obstacles, difficulties, pain and/or setbacks.

Goals and Strategies

The Athletic Department's goal is to help attract high quality officer candidates and to develop them into outstanding junior leaders.

Goals in the Department can be described as department or program oriented. The Athletic Department staff, while conducting Strengths, Weaknesses, Opportunities and Threat (SWOT) analysis identified key issues that were subsequently formulated into the following goals:

- to maintain diverse athletic programs, i.e., Physical Education, Competitive Intramural Sports, Varsity and Recreation;
- to provide athletic programs that encourage and provide opportunities for development of leadership, physical fitness and a healthy lifestyle;
- to take advantage of the flexible and willing support of the RMC Club and Foundation;
- to take advantage of the Red and White Club for recruiting varsity athletes;
- to take advantage of the reduced Varsity Program to focus and increase College support for the remaining Varsity sports;
- to increase the presence of the RMC Athletic Department on the Internet and in local, provincial and national media;
- to improve upon the historic performance of RMC Varsity teams;
- to gain greater control or influence over the recruiting and selection process for candidates to facilitate the recruiting of Varsity athletes;
- to provide recruiting centres, through the Red and White Club, with accurate and correct Athletic Department information for new recruits;
- to acquire expanded facilities to facilitate RMC hosting of athletic events and competitions;
- to establish a stable departmental budget; and to contribute to the rationalization and coordination of demands on officer-cadets' time.

Programs

Physical Education Program

The aim of the Physical Education Program is to:

- develop a basic knowledge of physical education theory and philosophy;
- develop physical fitness through a program of strenuous physical activities;
- develop sports skills and introduce the fundamentals of team play as commonly practiced by

members of the CF;

- develop skills in lifetime sports which have both a social and a fitness value;
- develop leadership and organizational abilities through opportunities in various team and individual activities; and
- award military and/or civilian recognized qualifications.

Officer-cadets participate in two consecutive compulsory 50 min periods. The Physical Education Program is divided in two folds:

- the development and maintenance of a high level of physical fitness which will enable all officer-cadets to attain the required standard on the RMC physical fitness test; and
- the development of officer-cadets who are knowledgeable and experienced in fitness training methods, who are capable of performing a variety of sports skills and military activities, and who have the ability to organize and administer athletic events.

Physical fitness testing takes place three times a year i.e. during the Fall, Winter and Spring trimesters. RMC PPT and CF EXPRES TESTING

The Royal Military College Physical Performance Test (RMC PPT) requirement. To meet the Athletic component requirement, students will be required to pass two tests out of three annually. The I years will attempt three RMC PPTs and the II-IV years will be evaluated on two RMC PPTs and one EXPRES. All RMC students will be required to have, at all times, a valid EXPRES. Therefore, I years who come to RMC without one will be tested during the year on their own time. The Evaluation Coord will administer the appointments to meet the students availability;

The RMC PPT is composed of 5 items, the 20-meter shuttle run (20MSR), push-ups, sit-ups, an agility run and a standing long jump. Each item is scored on 100 points for a total of 500 points.

All officer-cadets are required to attain a the RMC minimum standard which is a total of 250 points and pass each item of the physical evaluation. 50 points is the minimum required to pass the 20 MSR and 35 points is the minimum for each of the four others items..

Officer-cadets who do not reach the minimal standards or had medical restrictions for a RMC PPT are given a second chance with a retest. If they fail a second time, they are taken in charge by the Supplementary Physical Training Fitness Coordinator who leads the training sessions.

Testing sequences.

- **I years.** Will do three RMC PPTs. Incoming students who do not possess a valid EXPRES will be required to complete one before the end of academic year;
- **II and III years.** Will do the RMC PPT in the Fall and Winter terms. Students who are not eligible for the EXPRES exemption will complete their EXPRES in the spring;
- **IV years.** Will do a RMC PPT in the fall and winter terms. All IV year students will complete their EXPRES at the end of the spring term regardless of their eligibility for an exemption. By the fourth year, most students should be able to achieve their exemption level, which will extend their requirement period for their next test; and
- **Re-test.** A group re-test will be scheduled for students who were medically excused or were on duty away. As stipulated in the CFAOs, all students who do not meet the MPFS, will have to

wait a three-month training period before another attempt can be done. A time slot could be incorporated within the in-clearance schedule (starting Aug 07).

Varsity Program

The aim of the varsity program is to achieve competitive excellence. This will mean different things to different sports; however, the aim in general is that:

- RMC become a highly respected opponent in terms of competitive challenge and sportsmanship;
- RMC is the smallest university member of the Canadian Interuniversity Sport (CIS) with a student population of 900 officer-cadets in the undergraduate program. It has to overcome a talent deficit through recruiting, outstanding preparation and performance;
- provide an opportunity for students to participate in organized, highly-skilled and competitive athletics;
- instill, through the demands of training and competition, self-discipline, the desire to excel and willingness to compete in a team effort;
- create a College "esprit de corps;"
- provide an opportunity for interaction with other contemporary university athletes thereby bringing RMC into the focus of the civilian community;
- improve physical fitness; and
- provide leadership opportunities.

The Royal Military College of Canada offers an extensive varsity sports program students capable of participating at a higher skill level.

RMC competes as a member of the Ontario University Athletics (OUA) in the following events: basketball (men and women), fencing (men and women), hockey (men), rugby (men), soccer (men and women) and volleyball (men and women).

The taekwondo team competes at local, provincial and national levels.

The varsity program is an extension of the physical education program and thus contributes to the achievement of the overall aim by instilling a high degree of self-discipline, the desire to excel, and the willingness to sacrifice personal interest for coordinated team effort. The Varsity Program also provides an opportunity for involvement with contemporary university students, thereby bringing the Royal Military College of Canada into the focus of the civilian community.

Competitive Intramural Sports Program

The aim of the Competitive Intramural Sports Program is to:

- provide leadership opportunities;
- improve officer-cadets' physical fitness;
- foster a competitive environment;
- develop team and squadron spirit;
- promote active and healthy living; and
- expose students to a variety of team sports.

The Competitive Intramural Sports Program has a twofold purpose.

- **First**, it provides each cadet with the opportunity to develop sports skills and apply the principles, which are taught in the Physical Education Program.

- **Second**, it provides each cadet with the opportunity to compete in a variety of team sports on a weekly basis.

The Competitive Intramural Sports Program is composed of sports leagues within the College, where each squadron forms teams to compete. The program is compulsory for cadets who are not varsity athletes.

The fall term Competitive Intramural Sports Program offers leagues such as soccer, hockey, ultimate, basketball, water polo and ball hockey. Included in the winter term Competitive Intramural Sports Program are basketball, dodgeball, water polo, hockey, and ball hockey.

The program is organized on a seasonal basis. The fall program runs from October to the end of November, and the winter program runs from January to the end of March. Responsibility for the day-to-day operation of the program is given to the cadets themselves under the supervision of the Recreation and Intramural Manager, thus affording them an opportunity to develop qualities of leadership. In addition to playing, cadets are expected to learn and carry out the duties of coaches, managers, team captains, game officials, and league convenors.

Officer-cadets are assessed on every phase of the program and the cumulative assessment becomes part of their personal service file.

All officer-cadets must participate in the Cadet Wing championship events. The Wing tournaments normally offer activities such as flag football, soccer, ultimate beach volleyball, sports tabloid activities and the Harrier cross-country race and Winter games activities.

Recreation Program

The aim of the RMC Recreation Program is to:

- provide leadership opportunities;
- leisure activities of choice;
- develop social skills and self-fulfilment; and
- promote active and healthy living.

The RMC Recreation program consists of clubs that are organized around different recreational activities that include group and individual sports and hobbies. All students and staff at RMC are permitted and encouraged to participate in the Recreation Program. The list of clubs is subject to change depending on the interest: Arts, Astronomy, Broomball, Climbing, Cycling, Debating, Drama, Duke of Edinburgh's Award, Equestrian, European Team Handball, Fish and Game, Historical Old 18, Jiu-Jitsu, Judo, Karate, Outdoor, Photo, Power Flying, Sailing, Second Language, Shooting, Social Dance, Stage Band, Video Editing, War Games, Waterpolo and Windsurfing.

Facilities & Equipment

Facilities and Equipment

RMC's athletic facilities are shared with those of CFB Kingston and include a large triple-gymnasium with various combinations of basketball, volleyball and badminton; one field house which includes one 200-meter indoor track and four large sports courts; one 25-meter, 8 lanes pool; one small warm-up pool; one weight training and cardio area; one indoor artificial ice arena; eight soccer fields; five outdoor tennis courts; six squash courts, and two martial arts rooms.

With its location on Lake Ontario, the College has excellent facilities for recreational sailing and

boating.

In addition to the athletic facilities, use is made of nearby military recreation facilities, which include an eighteen-hole golf course and a curling rink.

Equipment is provided for participation in the Physical Education Program, Varsity Program, Competitive Intramural Sports Program and Recreational Program.

Professional Military Training

General Information

Senior Staff

Director of Cadets - Colonel J.G.B. Ouellette, CD

Deputy Director of Cadets - Lieutenant Colonel R.R. McDonald, CD

Chief Instructor - Major A.E. Reiffenstein

Staff Officer Standards - Capt J.M. Cowley

Staff Officer Training - Major A.J.M. Labrecque

Cadet Wing Sargent-Major - Master Warrant Officer J.B.M. Colbert, CD

Training Cell

The Military Component of the ROTP, RETP, and UTPNCM programmes at RMC provides Professional Military Training during the academic year. This Component is compulsory for all OCdts in all years.

Programme Objectives

Purpose

The main purpose of the Military Component is to identify, develop, and consolidate the moral qualities and ethical values which are essential for a military officer. These qualities and values include: honesty, loyalty, integrity, honour, and courage. These are also very effectively captured in the College's motto of "TRUTH, DUTY, VALOUR".

The Military Component also develops and prepares OCdts to function effectively within the College and Cadet Wing organization.

Programme Design

Programme Design

The personal, team, and leadership skills and values required of an officer must be exercised on a continuous basis, at all times, in all places, in all situations. The Military Component provides the necessary forum for the development and assessment of these qualities by exposing OCdts to a wide variety of training scenarios.

Focus By Year

The programme is designed to achieve three important transformations in the officer candidates over the

four years at RMC. These are: adolescent to adult, imposed discipline to self discipline, and followership to leadership. The emphasis by year is as follows:

- **1st year** - Personal Development, Followership, Teamwork
- **2nd year** - Personal Development, Teamwork, prepare for Leadership positions
- **3rd year** - Personal development, Leadership
- **4th year** - Personal development, Leadership, prepare for Commissioning

Courses Of Study

There are six main areas of competence, which are identified as Performance Objectives (PO's). These can be considered as courses of study, using a combination of formal classroom instruction and a wide variety of practical exercises. The six PO's are:

1. General Military Knowledge
2. Personal Attributes
3. Teamwork
4. Leadership
5. Communications, and
6. Drill

Programme Delivery

Three periods per week are allocated for drill classes or other formal classroom instruction. Weapons and refresher training is completed during Division Training Weekends. Additional training, professional development, and occupation and element-specific exposure are also provided on chosen weekends throughout the academic year. Practical leadership and teamwork activities such as dress and room inspections and Squadron level parades, are scheduled on weekday mornings. Wing and College level activities take place during Duty Weekends as listed in the Table at the end of this Section. In third and fourth year, OCdts are appointed to various command and staff positions to provide semester-long development and assessment opportunities.

Equivalencies And Credits

The military record of service for OCdts in the UTPNCM programme, or for OCdts in the ROTP and RETP programmes who have previous military service, is reviewed upon joining RMC. Previous training may be accepted for credits under the Military Component.

Course Descriptions

Course Code Legend

Course Identification Codes

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

Example: EEE341B

Code	Explanation
EEE	The first two letters indicate the Department or subject of the course; in this example it is Electrical Engineering. The third letter indicates the language in which the course is given, either E for English, as in the above example, or F for Français (French).
341	The three-digit course numbering indicates exactly which course in a subject area is referred to. The first digit indicates the year in which the course is normally offered. The second and third digits indicate the departmental course number.
A or B	The seventh character, if present, indicates that the course is a one-term course. The letter A indicates that it is given in the Fall Term and the letter B indicates a course given in the Winter Term. A code of only six characters represents a full-year course. Some courses have an "A/B" as the seventh and eighth characters. This indicates that the course may be given in the fall or winter.
Other Codes used in conjunction with course descriptions	
DL	Distance Learning This course provides paper documents for students to learn at a distance.
DL + web	Web-based Distance Learning , This course includes some paper documents but uses the Internet in its delivery.
DL + SP	Self-paced Distance Learning This paper-based course is not tied to the university semester system, and students may register and submit assignments at any time.
Credit	The number of credits students will receive upon finishing the course; these credits can be either academic or military. Normally 1 credit is given for a "one term" course and 2 credits for a "full year" course.
3-1-6	The estimated number of weekly working hours the course requires The first number is estimated classroom hours; the second estimated laboratory hours; the third estimated at-home study hours. Standard undergraduate-level university courses require three hours of class time and six hours of independent study time a week.

Note:

Credit for one-half of a full-year course may be granted and in such cases a seventh character will augment the course identification code. Addition of the digit "1" represents completion of the Fall Term portion of the course while the addition of the digit "2" denotes completion of the Winter Term portion.

BAE Business Administration

CEE Civil Engineering

CCE Chemistry and Chemical Engineering

CSE Computer Science

AAF Administration des affaires

GCF Génie civil

CCF Chimie et génie chimique

INF Informatique

ECE Economics	ECF Économie politique
EEE Electrical Engineering	GEF Génie électrique
ENE English*	FRF Français
GEE General Engineering	IGF Ingénierie générale
GOE Geography	GOF Géographie
HIE History	HIF Histoire
MAE Mathematics	MAF Mathématiques
MEE Mechanical Engineering	GMF Génie mécanique
MSE Military and Strategic Studies	EMF Études militaires et stratégiques
PHE Physics	PHF Physique
POE Politics	POF Politique
PSE Military Psychology and Leadership	PSF Psychologie militaire et leadership
SCE Science	SCF Sciences
SLE Second Language*	LSF Langue seconde*
SPE Spanish*	ESF Espagnol

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

ATH Athletic Component	ATH Composante athlétique
PMT Professional Military Training	FPM Formation professionnelle militaire

Business Administration

1st Year

BAE100	Principles of Management in a Defence Setting
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Only offered through the Division of Continuing Studies. Please visit: http://www.rmc.ca/academic/continuing/calendar/badescriptions_e.html

Management is a very broad subject. BAE100 is an introduction to Management, and establishes a framework for understanding how the other courses in Business Administration relate both to the principles of management and to each other. The course concentrates on the role of the manager and the associated principal tasks of planning, organizing, leading and controlling. Understanding of the principles of management is achieved by examining the theory evolving from the major research on the subject, combined with practical examples to demonstrate the theory.

Note: This course will be replaced by BAE/AAF101. Students may not take both BAE/AAF100 and BAE/AAF101 for credit.

0- 0- 9

Credit(s): 1

DL

BAE101	Introduction to Defence Management and Decision Ma
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Only offered through the Division of Continuing Studies. Please visit: http://www.rmc.ca/academic/continuing/calendar/badescriptions_e.html

Providing a broad introduction to management - including its principles and practices - in a Defence setting, this course identifies the mechanisms affecting the management of military and civilian personnel at the institutional level (i.e., within both the CF and DND at large), and covers topics in organization, roles and responsibilities, resources and capabilities, operational activities, and business planning. The course also provides an overview about the role of the individual manager and the associated principal tasks of planning, organizing, leading, decision-making, and controlling in a variety of dynamic circumstances.

Note: Students may not take both BAE/AAF100 and BAE/AAF101 for credit.

0- 0- 9

Credit(s): 1

DL + web

2nd Year

BAE202A	Financial Accounting I
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Also offered through the Division of Continuing Studies as BAE202. Please refer to the [Division of Continuing](#)

Studies for more information.

This course provides an introduction to the principles, practice and process of financial accounting. The student is introduced to the theory and mechanics of financial accounting with an emphasis on the presentation and development of accounting as an information system. Major topic areas include accounting theory, the processing of accounting data, accounting for assets, liabilities, owner's equity and the preparation and interpretation of financial statements.

Prerequisites: (MAE106 and MAE108, ENE110 and ECE102 (or their equivalents)) OR (MAE106, ECE102, BAE100 or BAE101)

3- 0- 6

Credit(s): 1

BAE204**Financial Accounting**

Only offered through the Division of Continuing Studies. Please visit: http://www.rmc.ca/academic/continuing/calendar/badescriptions_e.html

This course provides an introduction to the principles, practice and process of financial accounting. The student is introduced to the theory and mechanics of financial accounting with an emphasis on the presentation and development of accounting as an information system. Major topic areas include accounting theory, the processing of accounting data, accounting for assets, liabilities, and owner's equity, and the preparation and interpretation of financial statements. Time permitting, the accounts of the federal government will also be introduced.

Prerequisites: MAE106, ENE101, ENE102, and ECE102 (or their equivalents), or MAE106 and either BAE100 or BAE101.

0- 0- 9

Credit(s): 1

DL

BAE208B**Managerial Accounting**

This course introduces students to the fundamentals of management accounting within the organization. The early part of the course examines basic terms, concepts and systems of management accounting before moving on to more specific topics such as activity based costing, budgeting, variance analysis, and cost allocation. The course emphasizes the use of accounting information for planning and control within the organization and the appropriate use of accounting information for other types of decision making such as pricing and product profitability decisions. The role of management accounting in systems supporting quality programmes and just in time delivery is considered. Other types of decision making using accounting information such as capital budgeting and transfer pricing are examined as time permits. Consideration will be given to the behavioural and motivational impact of various management accounting systems.

Prerequisite: BAE202A, or BAE204 or BAE246.

3- 0- 6

Credit(s): 1

BAE220A/B**Introduction to Information Technology**

Also offered through the Division of Continuing Studies as BAE220. Please refer to the [Division of Continuing Studies](#) for more information.

This course is intended for students who will use Information Technology (IT) in the workplace. It is not intended for computer or systems professionals. The course will provide students with an introduction to the fundamentals of IT and its applications in an organizational setting. Students will be expected to have basic computer skills such as the ability to use a modern integrated office software package. Students who lack these skills will be required to take part in a skills lab. Topics include: Computer Hardware, Computer Software, Networking, Data Management, Uses of IT in Organizations, Development of Information Systems, Ethics and Information Technology.

Pre-requisites: (MAE106, ENE110 and ECE102 (or their equivalents)) OR (MAE106, BAE100 or BAE101)

3- 0- 6

Credit(s): 1

BAE240**Human Resource Management in a Defence Setting**

Only offered through the Division of Continuing Studies. Please visit: http://www.rmc.ca/academic/continuing/calendar/badescriptions_e.html

This course examines a selection of key human resource issues in the contemporary Canadian workplace. It begins with an overview of the human resource function in organizations and covers in an in-depth way the principal challenges facing leaders, managers and human resource specialists. Topics include strategic HR planning, government and societal influences, recruitment, selection, career development and career management, performance appraisal, compensation and benefits, employee rights, grievances, mechanisms of voice, and employee motivation. *Leadership* is a major and recurring theme.

0- 0- 9

Credit(s): 1

DL + web

BAE242A/B**Quantitative Methods I**

This course introduces students to the application of probabilistic and statistical techniques to business problems. Major topics include probability theory, estimation, confidence intervals and inference, all in the context of business problems.

Prerequisites: (MAE106, MAE108, ENE110 and ECE102 (or their equivalents)) OR (MAE106, MAE108 (or equivalent coursework in Mathematics), BAE100 or BAE101).

3- 0- 6

Credit(s): 1

BAE244	Quantitative Methods Applied to Defence Management
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Only offered through the Division of Continuing Studies. Please visit: <http://www.rmc.ca/academic/continuing/calendar/bad e scriptions e.html>

This course introduces the use of quantitative methods in managerial decision-making. Emphasis is placed upon analyzing and drawing conclusions from data sets and on the use of specific techniques in making managerial decisions. Topics covered include probability, probability models, statistical inference, single and multiple regression, decision analysis, risk, and forecasting. Computer-based spreadsheet modeling and solution techniques are used extensively throughout the course.

Prerequisites: MAE106 and MAE108 (or their equivalents), and either BAE100 or BAE101

0- 0- 9

Credit(s): 1

DL + web

BAE246	Financial Accounting with Applications to Defence
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Only offered through the Division of Continuing Studies. Please visit: <http://www.rmc.ca/academic/continuing/calendar/badescriptions e.html>

This course is an introductory course in accounting. It is intended to provide a general understanding of financial reports and how they are prepared and used. Accordingly, the course emphasizes not only the procedures of accounting, but also the underlying principles and concepts of accounting and their application in a variety of contexts, including Defence.

Prerequisite: BAE100 or BAE101

0- 0- 9

Credit(s): 1

DL + web

BAE266	Management Decision-making in Defence
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Only offered through the Division of Continuing Studies. Please visit: <http://www.rmc.ca/academic/continuing/calendar/badescriptions e.html>

The ability to make good decisions is fundamental to success in today's military and business environment. The emphasis in this course is on managerial decision-making under uncertainty. Topics include stochastic inventory control, waiting-line models, computer simulation modeling, risk and decision analysis, and forecasting models. Computer spreadsheets are used extensively, with particular

emphasis on the interpretations and communications of model results from the viewpoint of decision-makers.

Prerequisites: BAE100 or BAE101, and a first-year mathematics course.

0- 0- 9

Credit(s): 1

DL + web

3rd Year

BAE300B

Finance

This course introduces the students to principles of financial decision-making. Topics include the theory of present value and interest, risk, capital markets, and valuation, and decision-making within the firm including the financing decision, and capital budgeting. The emphasis is on the application of the principles to solve business, military and administrative problems.

Pre-requisite: BAE242A/B, BAE244, BAE202A and BAE208B (or BAE204

3- 0- 6

Credit(s): 1

BAE302A/B

Financial Accounting II

This course provides a continued examination of the principles, practice and process of financial accounting. The students continue their introduction to the theory and mechanics of financial accounting with an emphasis on the presentation and development of accounting as an information system. Major topic areas include accounting theory, the processing of accounting data, accounting for assets, liabilities, owner's equity and the preparation and interpretation of financial statements. Time permitting; the accounts of the federal government will also be introduced.

Prerequisite: BAE202A

3- 0- 6

Credit(s): 1

BAE304A

Management Accounting

Also offered through the Division of Continuing Studies as BAE304. Please refer to the [Division of Continuing Studies](#) for more information.

This course introduces students to the fundamentals of management accounting within the organization. The early part of the course examines basic terms, concepts and systems of management accounting before moving on to more specific topics such as activity based costing, budgeting, variance analysis,

and cost allocation. The course emphasizes the use of accounting information for planning and control within the organization and the appropriate use of accounting information for other types of decision making such as pricing and product profitability decisions. The role of management accounting in systems supporting quality programmes and just in time delivery is considered. Other types of decision making using accounting information such as capital budgeting and transfer pricing are examined as time permits. Consideration will be given to the behavioural and motivational impact of various management accounting systems.

Pre-requisite: BAE242A/B, BAE244

3- 0- 6

Credit(s): 1

BAE316B**Intermediate Marketing**

Also offered through the Division of Continuing Studies as BAE316 Marketing Management. Please refer to the [Division of Continuing Studies](#) for more information.

This course builds on the marketing basics by showing how marketing strategy is directly influenced by a firm's competitiveness and other macro-environmental factors. In addition, this course emphasizes the importance of customer orientation and strategic market planning, as well as introduces the subject of global marketing. The course will examine how all the elements of the marketing mix can be utilized to best achieve the firm's goals as well as the selection of target markets. The course will also examine how to respond to changes in the firm's environment.

Pre-requisite: BAE318 (formerly BAE216).

3- 0- 6

Credit(s): 1

BAE314A**Marketing Fundamentals**

(Formerly BAE216) Also offered through the Division of Continuing Studies.

This course provides an introduction to the fundamentals of Marketing within a business organization. The course will begin with an examination of consumer and business-to-business markets, before moving on to the major components of competitive marketing strategy, namely product/service development, pricing, distribution and promotion. The course will provide a foundation for future work in this area. No prerequisites are required although knowledge of differential calculus or microeconomics is helpful.

Pre-requisites: BAE220A/B.

3- 1- 6

Credit(s): 1

BAE326B**Human Resources Management**

Also offered by the Division of Continuing Studies

The basic purpose of every human resource system is to acquire, develop and maintain the right kinds and numbers of people necessary to achieve organizational objectives. Taking a general systems approach this course examines the major human resource management (HRM) functions and their impact on organizational effectiveness. Representative topics include demographics and personnel supply; human rights legislation and employment equity; human resource planning; recruiting and selection; training and development; and compensation and benefits.

Prerequisites: (PSE301A) OR (BAE100 or BAE101, ENE110 (or equivalent) and PSE112 or PSE123B

Note: Also offered through the department of Military Psychology and Leadership as PSE306

3- 0- 6

Credit(s): 1

BAE342A/B**Quantitative Methods II**

This course continues the study of the disciplines of operations research and management science and their application to business, military and administrative problems. Topics include linear programming, integer programming, networks and computer simulation. As is the case in the prerequisite course, emphasis is on application and each topic is introduced and motivated by a specific management issue or problem.

Pre-requisite: BAE242A/B.

3- 0- 6

Credit(s): 1

BAE344B**Operations Management**

This course presents a qualitative overview and introduces quantitative methods used in planning and managing operations in the service and production sector of the economy. Topics include: design, process selection, capacity planning, project control, quality control, response to customer, cost/benefit analysis, facility layout, inventory and, supply chain management.

Pre-requisite: BAE242A/B, PSE301 (or their equivalents).

3- 0- 6

Credit(s): 1

BAE360**Human Factors**

Not offered in Academic Year 2004-2005

Human factors is a rapidly growing field. Ten years ago, it would have been difficult to find anyone outside of the human factors profession who could tell you the meaning of the term ergonomics. Today, good human factors design has become a major marketing tool that can provide a competitive advantage for those who choose to design with the "human" in mind. This course explores both sides of the human-machine interface. It includes a study of a broad range of human attributes from cognitive processes to anthropometry (measurement of the human body). Based on an understanding of these attributes, we turn our attention to the machine and examine basic design principles and practices that ensure the machine interface takes human abilities and weaknesses into consideration. The third major component of the human-machine system is the environment in which they work. The course looks at a few key environmental issues that can affect performance. As a final topic, we will look at human computer interaction and how the same fundamental human factor design principles can be applied to what is becoming perhaps the most common type of human-machine system.

Prerequisite: BAE220A/B, PSE301, BAE344B

0- 0- 9

Credit(s): 1

4th Year

BAE410A/B

Information Systems

The objectives of this course are to provide a solid managerial perspective in the concepts essential to: 1) analyse and understand the capabilities and limitations of information technology so one can be an effective user of computers; 2) analyse, design, develop, implement and use MIS in organizations. Subjects covered include: role of information technology in organizations; strategic role of information systems in organizations; concepts, tools and techniques for systems development; managing information systems implementation; managing information system resources, Decision Support Systems; and managing International Information Systems.

Pre-requisite: BAE220A/B, PSE301, BAE344B

3- 0- 6

Credit(s): 1

BAE420A/B

Business Law

A basic introduction to the Canadian legal system with a focus on the areas of law of particular relevance to business. The course will briefly discuss the court system and civil procedure. Greater emphasis will be placed on the law of tort and contract.

Pre-requisite: (PSE301) OR (BAE100 or BAE101, BAE326B (or BAE240)).

3- 0- 6

Credit(s): 1

BAE426A/B**Labour Relations**

This course examines the basic issues in labour relations such as union certification and negotiation and administration of collective agreements. Other selected topics in labour relations and employee relations will also be covered.

Prerequisites: BAE326B / PSE306B.

Note: Not offered every year.

3- 0- 6

Credit(s): 1

BAE432A**Organizational Theory**

This course examines organizational theories, structures and processes. Organizational theories to be examined include classical management theory, contingency theory, open systems theories, theories based on technological imperatives and theories of bureaucracy. Emphasis will be placed on issues relating to process including organizational change, politics, power and control in organizations, organizational legitimacy and organizational design.

Pre-requisite: PSE301.

3- 0- 6

Credit(s): 1

BAE440A/B**International Management**

This course will focus upon the opportunities and threats with which a firm must contend to become globally competitive and to be able to effectively operate within an international setting. A particular emphasis will be placed on multinational corporations, that is, companies that have significant interests across nations. Course topics include consideration of: the international macro-environment, including its economic, political, legal, technological and social elements; the role of culture, including the challenges faced when managing, motivating and leading persons across a variety of cultures; and international strategic management, including strategic planning, organizing international operations and decision-making in an international context.

Pre-requisite: BAE316B, BAE344B.

Co-requisite: BAE410A/B.

Note: For students in Fourth Year Business Administration and others with the permission of the Department

3- 0- 6

Credit(s): 1

BAE450A/B**Advanced Topics in Management**

This course examines topics from a number of management areas. The course will provide the student who has completed the more basic courses with exposure to more complex issues in areas such as accounting, marketing, production, quantitative methods and human resources management. In addition, the course examines areas of management the student has not previously been exposed to such as international business and logistics. Coverage of topics will be on a selective basis.

Pre-requisite: BAE300B, BAE344B.

Co-requisite: BAE410A/B.

3- 0- 6

Credit(s): 1

BAE452**Business Policy**

This course is intended to pull together material from the various Business Administration courses and illustrates the complex overlap that exists between areas in applied situations. In the examination of corporate strategy the focus will be on the application of theories, concepts and analytical techniques developed in other courses, to a variety of case problems and situations. The course examines how the internal resources of the firm, the organization of the firm and the environment of the firm, all influence the strategic choices that the firm makes. Over the two terms of the course students will also be required to work on a major project involving the development of a comprehensive business plan, for presentation to faculty and invited guests.

Pre-requisite: BAE300B, BAE316B, BAE326B, BAE344B

Co-requisite: BAE410A/B

3- 0- 6

Credit(s): 2

BAE490**Thesis**

This two-term course is available only to students of Business Administration who have an average of at least A- in 3rd year Business Administration courses. Students who take the course may substitute it in place of BAE450A/B and BAE440A/B. Before enrolling in the course a student must obtain the approval of a professor in the Department of Business Administration who will supervise the thesis. The topic of the thesis will be mutually agreed upon by the student and the professor and should be in one of the areas covered in one or more of the Business Administration core courses. The thesis topic should not be directly related to the major project of the course BAE452 - Business Policy.

Pre-requisite: Permission of the Department Head

Co-requisite: BAE410A/B, BAE432A, BAE452

3- 0- 6

Credit(s): 2

English

1st Year

ENE100 Introduction to Literary Studies and University Writing Skills

This course has two main objectives: to provide instruction in the techniques of expository writing and to foster an understanding and enjoyment of literature. The first term in particular will concentrate on correcting grammar and punctuation, organizing ideas, formulating persuasive arguments, and preparing research papers. Approximately one-quarter of the periods involves writing skills. The literary texts are spread through both terms and provide a sampling of different genres (the essay, the short story, lyric and narrative poetry, the novel, and the drama). Students are encouraged to develop an awareness of how the creative imagination expresses itself in literature as well as of how language shapes our perceptions of ourselves, society, and the universe.

The classes are divided into small sections for tutorials and discussions. There is a common core of texts consisting of narrative poetry, short stories, two novels, one Shakespeare play, and one modern play.

Texts as assigned by instructors.

Note: Mandatory for all Anglophone students of the First Year in the General Programme.

3- 0- 3

Credit(s): 2

ENE101 Literature and Composition I

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is divided between the study of literature - primarily through reading works of short fiction - and exercises and assignments that develop grammar and composition skills. The Course Reader comprises a selection of largely modern short stories by Canadian, American, and British writers, and is supplemented by a Canadian war novel. The course does not attempt an historical or chronological overview of modern short fiction; rather, the works of fiction have been grouped around common themes that explore the human condition as well as address concerns particular to military culture. General characteristics of fiction and effective strategies for reading and understanding literature are presented in the course notes. Grammar and writing skills are developed through auto-instructional methods that provide ample illustration and practice for each principle. Course work consists of required readings and grammar/writing lessons, four essay assignments, and a final exam.

0- 0- 9

Credit(s): 1

DL

ENE102 Literature and Composition II

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course introduces students to poetry and drama through examples of the genres from Shakespeare to the twentieth century. The first half of the course briefly considers the major features of poetry (figurative language, sounds, rhythm, etc.), looking closely at how a poem is organized, how specific subjects can be treated in a variety of ways, and how thematic and language patterns emerge. In the second half of the course, students study three plays: a Shakespearean tragedy and two contemporary works by Canadian dramatists. Topics for consideration include dramatic structure, characterization, theme, comedy, and tragedy. The course is not a national or historical survey of literature. Course work consists of four essay assignments - divided between poetry and drama - and a final exam.

Prerequisite: No prerequisite is required, but successful completion of ENE101 or equivalent is recommended

Note: Students will require an audiocassette player to listen to taped poetry and drama readings that accompany the course materials.

0- 0- 9

Credit(s): 1

DL

ENE110 Introduction to Literary Studies and University Writing Skills

This course has two main objectives: to provide instruction in the techniques of expository writing and to foster an understanding and enjoyment of literature. The first term in particular will concentrate on correcting grammar and punctuation, organizing ideas, formulating persuasive arguments, and preparing research papers. Approximately one-quarter of the periods involves writing skills. The literary texts are spread through both terms and provide a sampling of different genres (the essay, the short story, lyric and narrative poetry, the novel, and the drama). Students are encouraged to develop an awareness of how the creative imagination expresses itself in literature as well as of how language shapes our perceptions of ourselves, society, and the universe.

The classes are divided into small sections for tutorials and discussions. There is a common core of texts consisting of narrative poetry, short stories, two novels, one Shakespeare play, and one modern play.

Texts as assigned by instructors.

Note: Mandatory for all Anglophone students of the First Year in the Arts Entry Programme.

3- 0- 6

Credit(s): 1

ENE120 French-Canadian Literature in Translation

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

Through a detailed study of six French-Canadian novels translated into English, this course focusses on French-Canadian culture and its literature. It also introduces students to the practice of literary criticism. Four essay assignments assist in the development of analytic skills necessary for writing essays and for improving students' overall writing abilities.

0- 0- 9

Credit(s): 1

DL

ENE150 Advanced Writing Skills

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is aimed at the student who is competent with basic English grammar and written expression, but desires to develop and hone critical thinking and writing skills. Instructional materials address a broad number of forms and methods used in academic and non-academic writing. Topics range from matters of prewriting practices and the writing process, to aspects of sentence structure and argument, and the elements of style. Through analysis of sample essays and excerpts, students will learn how to move from topic to technique - to apply effective writing and organizational strategies that distinguish good writing wherever it is found.

Prerequisite: None, though students with pronounced problems in basic grammar and sentence structure are encouraged first to complete DCE050: Essential Writing Skills, a self-paced, modular course that is non-credit.

0- 0- 9

Credit(s): 1

DL

2nd Year

ENE200 Cross-currents of Thought in 20th-Century Literature

This course is designed to provide the student with an insight into major aspects of 20th-Century western thought as represented in selected works of English, Canadian, American, German, and Italian literature of the period. Special attention will be given to the varied pattern of 20th-Century social and psychological concepts, the continuous shifting of moral norms, and the search for a stable, authentic set of cultural and spiritual values. Works studied will include novels, poetry, drama and song lyrics; together, they offer both a regional and a planetary perspective on humanity, allowing us to consider variations in national and personal definitions of such things as heroism, "the good life," utopia/dystopia, male/female roles and gender issues, social and individual responsibility, and freedom.

Essays will be required in both the Fall and Winter Terms.

Prerequisite: ENE100 or ENE110 (or equivalent).

3- 0- 6

Credit(s): 1

3rd Year

ENE304

English Renaissance Literature

This course presents a survey of non-dramatic English prose and poetry from the time of Henry VIII to the end of the Puritan Commonwealth, an era often referred to as the golden age of English literature. Examination of authors' individual achievements will be combined with studies of form and genre in the period. The intention of the course is to provide an appreciation of the intellectual, cultural, and social milieu of the Renaissance. Students will study, for example, the sonnets of Shakespeare and the sixteenth-century poetry of Sidney, Spencer, Wyatt and Surrey within the contexts of humanism, courtly love and neoplatonism. In studying Renaissance education as a humanist ideal, they will examine such works as Sidney's *Defence of Poesy*, the great Renaissance defence of the study of literature, as well as Spencer's *Faerie Queene*, one of the finest allegories in the English language. In studying the Renaissance ideal of order, students will read Elyot's *The Book Named the Governour* and Sir Thomas More's *Utopia*. The study of seventeenth-century literature will include a detailed examination of Milton's *Paradise Lost*, the finest religious epic in English literature; Milton's *Aereopagitica*, his famous essay on censorship; Sir Francis Bacon's popular *Essays* on such topics as marriage, single life and friendship; and selected metaphysical poets, such as John Donne, who revolted against the conventionalism of earlier Renaissance poets.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2006/2007 and alternate years.

3- 0- 6

Credit(s): 1

ENE314A

Gender Representations in Literature

Also offered through the Division of Continuing Studies as ENE314. Please refer to the [Division of Continuing Studies](#) for more information.

This course aims to introduce students to the various ways literature reflects, constructs, reinforces, and challenges gender roles. The course will explore masculinity and femininity, suggesting that they are always socially constructed and historically specific by examining literature from the Middle Ages to the present. In order to do so, students will explore several different feminist approaches to literature and culture. Ultimately, the course will show that understanding gender as socially constructed rather than biologically given is empowering for society as a whole.

This course will also be offered through the Continuing Studies Division.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

3- 0- 6

Credit(s): 1

ENE315B**Gender Issues in Literature**

This course examines the various ways in which literature reflects, constructs, reinforces, and challenges gender roles. The course will explore "masculinity" and "femininity," suggesting that they are always socially constructed and historically specific. Students will examine the degree to which gender is an organizing principle in the daily life of Western civilization, looking first at how the gendered body is politicized in specific literary works (prose, poetry, drama) and films. They will then investigate how class and race have the potential to disrupt gender as a primary category of analysis. And, finally, they will discuss the challenges to gender analysis raised by the figure of the transgendered person.

Course Objectives

This course is intended, primarily, for English majors and will be seminar-style. Students should leave this course with the ability

1. to evaluate literature and culture for its ideological messages;
2. to analyze gender constructions in literature and culture;
3. to explain various feminist, pro-feminist, and "postfeminist" perspectives and applications; and
4. to conduct cultural criticism in general.

Pre-requisite: A 1st year English course.

3- 0- 6

Credit(s): 1

ENE324B**Literary Principles**

This course is an introduction to some of the main general questions which arise in the study of literature. Among the topics to be studied are (i) practical criticism (the analysis and evaluation of individual works of literature); (ii) the organization of literature as a field of study; (iii) the significance of the historical context of a work of literature; (iv) the contribution which other disciplines, such as psychology, anthropology, sociology, and linguistics, can make to the study of literature; and (v) the proper function of literature in the general intellectual economy of an individual and a society. A primary aim of the course will be to develop the student's skill as a critic, that is, his or her ability to speak and write about literature.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

3- 0- 6

Credit(s): 1

ENE326A Cultural Backgrounds to Literature

This course is an introduction to the cultural backgrounds essential to the study of English Literature. Students will examine the Bible as literature, the influence of classical mythology on English texts, and a selection of Greek and Roman texts in translation.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

3- 0-6

Credit(s): 1

ENE332A The Literature of War: The First World War

This course deals with the works of First World War writers, mainly novelists, from Canada, the United States, Great Britain, France and Germany. It will focus on their efforts to understand and articulate the effects of the war and combat experience on individuals and on society generally. The broad purpose of the course is to explore the perceptions of modern warfare as these emerge through the writings of former combatants and others who, indirectly through fiction, attempt to objectify and find meaning in their personal experiences of war. Students will be expected to present a seminar on an assigned text and to write a term essay based on that seminar.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

3- 0- 6

Credit(s): 1

ENE334B The Literature of War: The Second World War and After

This course deals with the works of Second World War writers, from Canada, Great Britain, the United States, Germany, and other nations. At the end of the course, there will be some discussion of works relating to more recent conflicts including Vietnam against the background of earlier writing. The general purpose of this course is to explore the evolving perceptions of modern warfare in light of the range and complexity of Second World War experiences of combatants and civilians. Works will reflect air, sea, and land warfare in Europe and the Pacific and on all sides of the conflict. Students will be expected to present a seminar on an assigned text and to write a term essay.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

3- 0- 6

Credit(s): 1

ENE350A Canadian Literature: Beginnings to 1945

Through a survey of English-Canadian fiction and poetry from the beginnings to the mid-twentieth century, this course attempts to identify shared perspectives, attitudes, ideas, and techniques

characteristic of our own distinctive literature. The writers under study invite us to reflect on who we are, where we came from and where we are going, as well as on the relationship between the nation's character and its landscape and on both the blessings and the challenges posed by the diversity of our rich multicultural mosaic. Representative writers include Richardson, Moodie, Haliburton, Lampman, Pratt, Leacock, Callaghan, MacLennan, and O'Hagan.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2006/2007 and alternate years.

3- 0- 6

Credit(s): 1

ENE352B	Canadian Literature: 1945 to the Present
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Through a survey of English-Canadian fiction, drama, and poetry from the mid-twentieth century to the present, this course endeavours to identify shared perspectives, attitudes, ideas and techniques characteristic of our unique literature. While designated as the complement to ENE350A, it is helpful but not necessary to take both courses together. No less than their predecessors, modern and contemporary writers like Findley, Davies, Laurence, Munro and Reaney encourage us to reflect on urgent questions of personal and national identity and survival: who we are, where we come from and where we are going. Atwood, Purdy and others explore the relationship between a nation's character and its landscape and assess the impact of the environment on storytelling, while Ondaatje, Layton and Coupland investigate how we respond to various social and cultural pressures, especially both the potential for growth and the challenges posed by the diversity of a shifting multicultural mosaic.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2006/2007 and alternate years.

3- 0- 6

Credit(s): 1

ENE384A	Post-Colonial Literature of Africa, South Asia, and The West Indies
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This course focuses on the post-colonial societies of Africa, South Asia, the West Indies and Latin America. Though these societies are spread over three continents, all of them are similar in having indigenous traditions which have been profoundly challenged and changed by European colonialism in the 19th and 20th centuries. Not surprisingly, the departure of the colonial powers did not mark the end of the European influence or of the identity crisis induced in these societies by colonialism. Fascinating and significant perspectives on these post-colonial traumas are offered by contemporary writers from these societies. Hence, students in this course will be encouraged to examine post-colonial literary works from Africa, South Asia, the West Indies and Latin America and to assess how writers in these societies have depicted the throes of revolution, the pain of exile, the struggle for freedom, the waning of colonialism and the anguish of alienation. Students will be required to participate in group discussions, make presentations, submit well-researched essays and write exams.

Prerequisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2007/2008 and alternate years.

3- 0- 6

Credit(s): 1

ENE386B**The Tale of Mystery and Imagination**

This course offers a critical and analytical approach to one of the most popular forms of literature in the nineteenth and twentieth centuries. Students will explore patterns of logical enquiry in numerous narrative forms. Students will encounter many variations of what the American writer Edgar Allan Poe (1841) called the tale of ratiocination (as well as the tale of mystery and imagination) in the works of such writers as Poe, Doyle, Collins, Stevenson, Christie, Hammet, Chandler, MacDonald and le Carré. Students will be expected to analyse and critically evaluate what they read in order to distinguish between the different incarnations of the tale of mystery and imagination - the classic British detective story, the "hard-boiled". American detective story, the thriller and the story of espionage - as well as to zero in on the social-political-psychological milieu that gave rise to them. Students will be required to participate in group discussions, make presentations, submit well-researched essays and write exams. Students will also be encouraged to engage in creative writing.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2007/2008 and alternate years.

3- 0- 6

Credit(s): 1

4th Year

ENE412A**Restoration and Eighteenth Century Literature: Satire and the Age of Reason**

This course deals with English literature of the period 1660 to 1740, and is concerned with the moral, intellectual, social and cultural values of that era, sometimes called The Age of Reason or the Neo-Classical Age. Studies will focus on important works of satire by such writers as Butler, Dryden, Pope and Swift. These writings will be explored with an eye to understanding the central concepts of the period: the idea of a rational universe, the threat of disorder, and the role of reason in human society and human psychology. Students will write a term essay on a selected topic.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2006/2007 and alternate years.

3- 0- 6

Credit(s): 1

ENE414B**Restoration and Eighteenth-Century Literature: Emergence of the English Novel and the Rise of the Middle Class**

This course deals with the emergence and development of the English novel between 1740 and 1800. It

will focus on the works of such writers as Defoe, Richardson, Fielding, Smollett, Goldsmith, and Sterne. Studies will explore the influence of sentimentalism on early English fiction and the effect of a growing middle-class readership on the fictional worlds created by these novelists. The purpose of the course is aimed at understanding better the role of the novel in articulating and shaping the ethical, moral, and social values of the late eighteenth century. Students will write a term essay on a selected topic.

Note: Offered in 2006/2007 and alternate years.

3- 0- 6

Credit(s): 1

ENE426**Advanced Directed Study**

This course is offered under special circumstances and at the discretion of the Department Head where a student with high standing in earlier English courses wishes to pursue a specific topic in some depth. The course is normally conducted on a tutorial basis and usually includes a considerable amount of written work.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: For students in Fourth Year Honours English at the discretion of the Department Head.

3- 0- 6

Credit(s): 2

ENE428**Shakespeare**

This course will be focussed entirely on the dramas of William Shakespeare. Students will examine Shakespeare's tragedies, comedies, histories, Roman plays, and romances within the context of a variety of critical approaches. A study of Shakespeare's plays will reveal the remarkable artistry of this great Elizabethan who is recognized as the world's finest dramatist, whose plays are performed more than those of any other playwright, and who has had a greater influence on English literature than any other literary figure. Dramas to be studied may vary from year to year but a typical course outline would include the following plays: Romeo and Juliet, A Midsummer Night's Dream, Much Ado About Nothing, Henry V, Julius Caesar, Twelfth Night, Hamlet, Othello, King Lear, Macbeth, The Winter's Tale and The Tempest. Students will study independently two additional plays. Students will submit an essay each term and, because the course will have a seminar format, students will frequently give seminar presentations, both major and minor.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Mandatory for students enrolled in Honours English. Also opened to other interested students. Normally taken in the Fourth Year.

3- 0- 6

Credit(s): 2

ENE 434A**Modern British Literature**

In this course, you will study selected poems and plays of representative modern and post-modern British poets and dramatists - Hardy, Housman, Yeats, Shaw, Owen, Lawrence, Eliot, Auden, Thomas, Larkin, Hughes, Heaney, Pinter, Stoppard - and assess how they have grappled with a variety of themes: the pros and cons of empire-building, the evils of colonialism, the pain of exile, the anguish of alienation, the quest for identity, the struggle for freedom, the lust for money and power, the love for life and God. You will also have an opportunity to understand how these writers struggle and come to terms with the varied socio-political events and issues such as the loss of empire, the Cold War, the emergence of a new "world order", the imminence of dystopia, the exploration of space, the advance of science and technology. You will be encouraged to approach the writers and their works historically and critically.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2006/2007 and alternate years.

3- 0- 6

Credit(s): 1

ENE 436B**Postmodern British Literature**

In this course, you will study selected short stories and novels of representative modern and post-modern British writers -Kipling, Conrad, Woolf, Forster, Joyce, Lawrence, Orwell, Greene, Burgess, le Carré - and assess how they have grappled with a variety of themes: the pros and cons of empire-building, the evils of colonialism, the pain of exile, the anguish of alienation, the quest for identity, the struggle for freedom, the lust for money and power, the love for life and God. You will also have an opportunity to understand how these writers struggle and come to terms with the varied socio-political events and issues such as the loss of empire, the Cold War, the emergence of a new "world order", the imminence of dystopia, the exploration of space, the advance of science and technology. You will be expected to scrutinize the writers and their works historically and critically.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2006/2007 and alternate years.

3- 0- 6

Credit(s): 1

ENE442A**English Dramatic Forms**

In this study of dramatic literature from medieval to modern times, students will examine a rich diversity of dramatic forms. The course will begin with an introduction to classical drama and its sustained influence on English literature and then proceed to a study of medieval religious allegorical drama, Renaissance tragedy and satiric comedy, Restoration and eighteenth-century comedies of manners, nineteenth-century comedy, modern discussion drama, tragicomedy, and musical drama. Plays by dramatists such as Sophocles, Marlowe, Jonson, Sheridan, Wilde, Shaw, O'Casey, Beckett, Peterson and Grey will be studied as representatives of dramatic forms and placed within their social and

historical contexts. Plays to be studied may vary from year to year but a typical course outline might include the following dramas: Oedipus Rex, Everyman, Dr. Faustus, Volpone, School for Scandal, The Importance of Being Earnest, Major Barbara, Juno and the Paycock, Waiting for Godot, Billy Bishop Goes to War.

The course will be given in a seminar format and in addition to submitting a term essay, students will frequently give seminar presentations, both major and minor.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Not offered in 2006/2007.

3- 0- 6

Credit(s): 1

ENE444B

Twentieth-Century Dramatic Literature

In this course which focuses on dramatic literature of the twentieth century, students will be introduced to a wide variety of modern dramas by eminent playwrights from North America, Britain, Europe, and Africa. Many of these writers have challenged traditional approaches to drama to invent new dramatic styles such as realism, naturalism, poetic drama, symbolism, expressionism, the epic theatre, the theatre of the absurd, and surrealism, to name only a few. Employing innovative dramatic forms and techniques, these writers use the dramatic medium to confront their audiences with major issues troubling the twentieth-century world. The conflict between individual rights and collective responsibility, the impact of colonialism, the relations between races and between men and women, the impact of war, the pursuit of the American dream, the moral obligation of the scientist are just some of the topics confronted in these dramas. All of these dramas, like the great literary works of previous eras, present a sharply focussed image of mankind in some crucial area of his existence. The modern theatre has its great definitive scenes which sum up man as he has come to sense himself in the twentieth century; his most fundamental hopes and fears, his understanding of the shape and currents of the world, and his intuition of his stance in relation to that world.

Plays and playwrights to be studied will vary from year to year, according to text availability and students' interests, but dramatic selections for the course will be made from British plays by Sean O'Casey, Samuel Beckett, and Harold Pinter; American plays by Edward Albee, Arthur Miller and Lorraine Hansberry; European plays by Berthold Brecht and Friedrich Dürrenmatt; and African plays by Wole Soyinka and Athol Fugard. We will also study a selection of exciting contemporary Canadian plays from playwrights such as Judith Thompson, Erika Ritter, Tomson Highway, David Fennario, David French, and John Gray.

Students will submit a term essay and, because the course will be given in a seminar format, they will frequently give seminar presentations, both major and minor. There will also be a final exam.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Not offered in 2006/2007.

3- 0- 6

Credit(s): 1

ENE446A/B**Art of Extremity**

This course is an examination of the way writers, artists, and filmmakers have reacted to a variety of extreme situations since the early 20th century such as love, war, alienation, and genocide. Through critical analysis and a comparative approach, students will evaluate the way such works of art become provocative chronicles and the conscience of their times.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

3- 0- 6

Credit(s): 1

ENE448B**Literature and Ethics**

This course seeks to introduce to the students a specific way of reading a text; that is, it will develop a notion of ethical criticism, which will allow them to analyze the encounter between the writer's ethos with their own. This kind of reading places a responsibility, not only on the readers toward the text and the author, but also on the ethical quality of their own readings. The ethical value of the texts and stories we tell each other, therefore, is highlighted. The course will be developed through an introduction to the concept of ethics and how various periods of history have developed their own ideologies, values and ethics, and how these are manifested in literature and the other arts. A study of a wide variety of texts from the ancient Greeks to contemporary cinema will offer the students ample opportunity to exercise their critical faculties.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2007/2008 and alternate years.

3- 0- 6

Credit(s): 1

ENE462A**Classic American Literature, Beginnings to 1945**

This course deals with American writing from the mid-nineteenth century to the mid-twentieth century. Through the nineteenth century, authors explored the American experience and emerging American identity by declaring their cultural independence from Europe. Their writings deal with such motifs as the escape from authority, the concepts of progress and perfectibility, race relations, and the quest for identity. Nineteenth-century American writing introduces readers to many of the preoccupations of twentieth-century American literature. In the early twentieth century the American *modernists* developed important innovations in poetry and prose. After the First World War many of these works were part of international culture, in which American writing, movies, and technology played an important part. Poets to be studied include Emerson, Frost, Sandburg, William Carlos Williams, Stevens, and T.S. Eliot. Core novels include Twain's *Huckleberry Finn*, James's *Daisy Miller*, Crane's *The Red Badge of Courage*, Hemingway's *A Farewell to Arms* / *The Sun Also Rises*, Fitzgerald's *The Great Gatsby*, and Faulkner's *The Sound and the Fury*.

Note: Offered in 2007/2008 and alternate years.

3- 0- 6

Credit(s): 1

ENE464B**American Literature Since 1945**

(Offered in 2003-2004 and alternate years)

This course deals with the period in which the United States has been the most important international power in the world. Many of the texts to be studied reflect both directly and indirectly the political, economic, and cultural forces that have preoccupied American authors as they looked at the world at large and looked inward at the American psyche. Some of the preoccupations in these writings include the paranoia stemming from the Cold War, the splits in American society caused by race relations and the Vietnam War, the impact of rapid technological changes, the ways in which mass media shape values, and the questioning of the American Dream, as traditional frontiers for American expansion closed. Poets to be studied include Robert Lowell, Allen Ginsberg, James Dickey, and Adrienne Rich. Core novels include Warren's *All the King's Men*, Ellison's *Invisible Man*, Bellow's *Sieze the Day*, Kerouac's *On the Road*, Webb's *Fields of Fire*, and Mason's *In Country*. A sampling of recent short stories will be included.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2007/2008 and alternate years.

3- 0- 6

Credit(s): 1

ENE469A**The War Film**

This course is an exploration of the development of the war film in North America and Europe since the beginning of the 20th century. Through critical analysis and a comparative approach, students will evaluate how this film genre represents WWI, WWII, the Korean War, and the Vietnam War. The films from each conflict will be analyzed in the social and political climate of the times as well as in relation to the economics of the film industry in Hollywood.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

3- 0- 6

Credit(s): 1

ENE474**Chosen Topics in Literary Studies**

This course is designed so that professors in the Department of English will be able to share with the students the results of their research in a particular area of literary studies that does not form part of the regular honours stream. Topics will vary with the interests and research of the faculty.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

3- 0- 6

Credit(s): 2

ENE476A**British Literature during the Romantic Period**

The backbone of this course is the study of the work of the six great British romantic poets, Blake, Wordsworth, Coleridge, Shelley, Keats, and Byron. Careful attention will be paid to the short lyric poems, and we will read parts of the longer narrative poems. Students will be encouraged to explore the common ideas which emerge in these poets, and the differing ideas of "romanticism" which are present. The prose of some of these authors will also be examined. Finally, the course will include the study of two novels, by Austen and Shelley.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2007/2008 and alternate years.

3- 0- 6

Credit(s): 1

ENE478B**British Literature of the Victorian Period**

The purpose of this course is to make students conversant with the literature of the Victorian period (1830 - 1901). We will read novels, poetry, and non-fictional prose. One theme of the course will be the role of this period as a transition between the romantic period and the beginnings of modernism in the 1890s. Some of the intellectual currents we will study are the spread of evangelical Christianity, the influence of utilitarianism, and the effects of scientific reasoning on the interpretation of the Bible. Special attention will be paid to the new roles and freedoms which developed for women during this period, and the way in which issues of social classes enter into the literature of the period.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2007/2008 and alternate years.

3- 0- 6

Credit(s): 1

ENE481A**World Literature I**

Through an examination of novels, short stories, plays and poetry from Africa, the Caribbean and Canada, this course will introduce students to some of the major writers of the "new literatures in English." Such writers invite us to consider how we encounter, explore and engage other countries and cultures, how we respond to foreign values and perspectives, how we meet new and unexpected challenges and unusual circumstances. Attention will be given to historical, social and cultural contexts as well as to appreciating the works within their own emerging tradition and within the parent tradition of English literature. Readings will be selected to illuminate such themes as human relationships in a changing moral and social world order and variations in national definitions of heroism, leadership, "the good life", racial and gender issues, relationships between the individual and society and between a

nation's character and its landscape. Commonwealth writers to be discussed include the internationally renowned V.S. Naipaul, Derek Walcott, Nadine Gordimer, Chinua Achebe, Ngugi wa Thiong'o, and Margaret Atwood.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2007/2008 and alternate years.

3- 0- 6

Credit(s): 1

ENE483B**World Literature II**

Through a survey of novels, short stories and poetry from Australia, New Zealand and India, students will familiarize themselves with outstanding writers of the "new literatures in English" Such writers invite us to consider how we encounter, explore and engage other countries and cultures, how we respond to foreign values and perspectives, how we meet new and unexpected challenges and unusual circumstances. The works are approached within their own social and cultural contexts as well as within their own emerging tradition and the parent tradition of English literature. Class discussion will focus on such themes as human relationships in a rapidly changing world and variations in national definitions of heroism, leadership, "the good life", racial and gender issues, relationships between the individual and society and between a nation's character and its landscape. Commonwealth writers under study include the internationally renowned Patrick White, Anita Desai, Thomas Keneally, R.K. Narayan, Miles Franklin and Keri Hulme.

Pre-requisite: ENE200 (completed, concurrent, or equivalent)

Note: Offered in 2007/2008 and alternate years.

3- 0- 6

Credit(s): 1

French Studies

1st Year

FRF150**Communication écrite**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is an introduction to written communication in French. In addition to increasing students' ability to recognize and employ good writing techniques, it aims to familiarize students with various types of writing (résumé, critical review, essay) and to explore strategies that facilitate writing across disciplines and genres.

Prerequisite: None, though students with pronounced problems in basic grammar and sentence structure are encouraged first to complete DEF050 - Français correctif, a self-paced course that is non-credit.

Note: This course is offered in French only.

0- 0- 9

Credit(s): 1

DL

FRF151**Cours de composition et d'introduction aux études littéraires**

The course is aimed at providing specialized training in oral and written French so that students become familiar with the main cultural and artistic expressions of the Francophone world. During this course, students will progress from the study of grammar and composition techniques to the study of French literature and culture.

Note: Compulsory course for French-speaking First Year Science/Engineering Programme students.

4- 0- 8

Credit(s): 2

FRF152**Cours de composition et d'introduction aux études littéraires I**

The course is aimed at providing specialized training in oral and written French so that students become familiar with the main cultural and artistic expressions of the Francophone world. During this course, students will progress from the study of grammar and composition techniques to the study of French literature and culture.

Note: Compulsory course for French-speaking First Year Arts students.

4- 0- 6

Credit(s): 2

FRF160 Introduction à la littérature canadienne-française

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course introduces students to French-Canadian literature through certain texts that are typical of the following literary genres: drama, the novel, and the story/legend. French-Canadian texts are examined with special emphasis on their socio-historical background, character development, and themes. The course also aims at developing students' analytical minds, and at improving their writing skills and knowledge of grammar through production of written work.

Note: This course is offered in French only.

0- 0- 9

Credit(s): 1

DL

FRF161 Cours de composition et d'introduction à la littérature française

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course introduces students to canonical texts in French literature. French literary works of various eras are studied; examined works will be mostly prose (novels, short stories, tales). Through a series of written assignments, the course will also increase students' skills in the organization and production of university-level written work.

Prerequisite: FRF160, or its equivalent, must successfully be completed before FRF161 may be taken.

Note: This course is offered in French only.

0- 0- 9

Credit(s): 1

DL

2nd Year

FRF201 L'image des Canadiens français à travers la littérature canadienne-française du XX^e siècle

Literary works (novels, poems, plays) will be used to study the major themes of French-Canadian literature and the way in which the French-Canadian community portrays itself. The main stages in the evolution of this self-portrayal will be studied. Students will also examine the main aesthetic and critical trends in French Canada in the 20th century.

Note: This course is intended for Second, Third and Fourth Year Engineering and Science students who speak and write French fluently.

1.5- 0- 3

Credit(s): 1

FRF202A L'image des Canadiens français à travers la littérature canadienne-française du XXe siècle I

Literary works written before 1960 (novels, poetry, plays) will be used to illustrate the main themes of French-Canadian literature and the way in which the French-Canadian community portrays itself. The main stages in the evolution of this portrayal will be studied. Students will also be introduced to the main aesthetic and critical trends in French Canada prior to 1960.

Note: This course is intended for Second, Third and Fourth Year students in Arts who speak and write French fluently.

3- 0- 6

Credit(s): 1

FRF204B L'image des Canadiens français à travers la littérature canadienne-française du XXe siècle II

This course continues FRF202A, looking at literary works written after 1960.

Note: This course is intended for Second, Third and Fourth Year students in Arts who speak and write French fluently.

3- 0- 6

Credit(s): 1

FRF262 Cours de composition et d'introduction aux études littéraires II

This course teaches advanced writing techniques and provides an introduction to the main trends of French literature in the 19th and 20th centuries and to the authors most representative of that period.

Prerequisite: FRF152 or equivalent

Note 1: Compulsory course for French-speaking Second Year Arts students.

Note 2: FRF262, or its equivalent, must successfully be completed before a senior course (300 and 400 level) may be taken, or it may be taken concurrently with a senior course.

3- 2- 0

Credit(s): 6

FRF264 Cours de composition et d'introduction à la littérature canadienne-française I

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is a study of advanced writing techniques (explanatory essay) and an introduction to

French Canadian literary movements and writers of the twentieth century. The aim of the course is to enable students, through their readings, to improve their analytical skills and to explore important Quebec and French Canadian literary works and movements, especially from a sociohistorical point of view.

Prerequisites: FRF160 and FRF161, or FRF151 (a two-term in-class course), or FRF152 (a two-term in-class course).

Note: This course is offered in French only.

0- 0- 9

Credit(s): 1

DL

FRF265	Cours de composition et d'introduction à la littérature française II
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Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is a study of advanced writing techniques (explanatory essay) and an introduction to French literary movements and writers of the nineteenth and twentieth centuries. The aim of the course is to enable students, through their readings, to improve their analytical skills and to explore important French literary works and movements, especially from a sociohistorical point of view.

Prerequisite: FRF264 - Cours de composition et d'introduction à la littérature canadienne-française I.

Note 1: This course is offered in French only.

Note 2: FRF264 and FRF265 are the equivalent of FRF262, a two-term, in-class course.

0- 0- 9

Credit(s): 1

DL

3rd Year

FRF306A	Littérature et civilisation canadiennes-françaises I
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This course provides an overview of the cultural evolution and the main literary trends in French Canada from 19th century to the Second World War.

Note: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF308B Littérature et civilisation canadiennes-françaises II

This course provides an overview of the cultural evolution and the main literary trends in French Canada from the Second World War to the present day.

Note: this course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF309 Littérature et civilisation canadiennes-françaises

The course provides an overview of the cultural evolution and the main literary trends in French Canada from the 19th century to the present.

Note: This course is intended for Second, Third and Fourth Year Engineering and Science students.

1.5- 0- 3

Credit(s): 1

FRF316A Linguistique différentielle de l'anglais et du français I

The course examines the linguistic differences between the two languages, focussing mainly on interference (anglicisms). The translation exercises are taken from general and military texts.

Note 1: Offered in 2007/2008 and every second year thereafter

Note 2: This course is intended for French-speaking Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF318B Linguistique différentielle de l'anglais et du français II

The course examines the linguistic differences between the two languages, focussing mainly on interference (anglicisms). The translation exercises are taken from general and military texts.

Prerequisite: FRF316A or equivalent.

Note 1: Offered in 2007/2008 and every second year thereafter.

Note 2: This course is intended for French-speaking Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF320A Civilisation de la francophonie I

This course provides an overview of French culture (l'Hexagone) through the study of short literary works and other documents. Writing exercises are a component of this course.

Note 1: Offered in 2007/2008 and every second year thereafter.

Note 2: This course is intended for Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF322B	Civilisation de la francophonie II
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This course follows up on FRF320A by providing an overview of francophone culture outside of France (Belgium, Haiti, French Antilles, Sub-Saharan French Africa, Maghreb, etc.).

Note 1: Offered in 2007/2008 and every second year thereafter.

Note 2: This course is intended for Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF330A	La guerre et la condition militaire dans la littérature d'expression française I
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The course examines the portrayal of war and military life, in French literature and in writings which have had a determining influence on French literature, from Antiquity to the present day. The works covered in the course include novels, memoirs and poetry. Students will be required to take part in seminar discussions and prepare dissertations.

Note 1: Offered in 2007/2008 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF332B	La guerre et la condition militaire dans la littérature d'expression française II
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The course examines the portrayal of war and military life, in French literature and in writings which have had a determining influence on French literature, from Antiquity to the present day. The works covered in the course include novels, memoirs and poetry. Students will be required to take part in seminar discussions and prepare dissertations.

Note 1: Offered in 2007/2008 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF340A	Variétés linguistiques canadienne-française et française
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The aim of this course is to compare the characteristics of spoken French in Canada by analyzing the

historical, political, economic and social contexts underlying linguistic variants. Students will be asked to describe the nature of "joual" and its influence in literature and in everyday speech. They will be able to recognize the potential of anglicisms to pose a danger to the language while offering possible enrichments. Lastly, importance will be placed on the necessity of establishing norms specific to French spoken in Canada, and on the usefulness of a Quebec French descriptive dictionary.

Note: Offered in September 2007 and every second year thereafter.

3- 0- 6

Credit(s): 1

FRF344A**Stylistique française I**

This course is intended for Third and Fourth Year students in Arts. Students will acquire the knowledge necessary to appreciate and analyze stylistic effects and to improve their writing style. A wide range of documents (newspaper articles, speeches, advertising, literary texts, etc.) will be analyzed. Writing exercises will teach the student to adopt the style best suited to the function of the texts they produce.

Prerequisite: FRF262 or equivalent.

Note: Compulsory course for third year students in the French Studies programme.

3- 0- 6

Credit(s): 1

FRF346B**Stylistique française II**

Students will acquire the knowledge necessary to analyze stylistic effects, especially word play; to analyze the structure of literary texts; and to improve their writing style. Literary texts, especially short stories, will be analyzed. In this course, students will be required to finish short stories by illustrating different narrative points of view and different styles. As well, they will be expected to compose a short story.

Prerequisite: FRF344A or equivalent.

Note 1: Compulsory course for third year students in the French Studies programme.

Note 2: This course is intended for Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF348A**Historical and linguistic approach to the French language I**

This course introduces the student to historical linguistics and the classification of languages, and goes on to explore the origins of the French spoken in France and the French spoken in Canada. Then, with the aid of the major twentieth-century linguistic theories (structuralism, functionalism, generative grammar), the student will become familiar with the terminology and the nature of descriptive linguistics and French grammar.

Note 1: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF350B Historical and linguistic approach to the French language II

This course will examine the major fields of modern linguistics: phonology and phonetics, derivational and inflexional morphology, semantics, lexicography, and syntax.

Prerequisite: FRF348A

Note 1: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for Third and Fourth Year students in Arts

3- 0- 6

Credit(s): 1

FRF352A Le roman français au XIX e siècle et ses antécédents

The course is a study of the evolution of the novelistic genre from the Middle Ages to the present day, with emphasis on the 19th century. The main trends and notable works will be examined in relation to the art and thinking associated with each period.

In addition to the readings, students will be required to write in-depth compositions.

Note 1: Offered in 2005-2006 and every second year thereafter

Note 2: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF354B Le roman français au XXe siècle et ses antécédents

The course is a study of the evolution of the novelistic genre, with emphasis on the 20th century. The main trends and notable works will be examined in relation to the art and thinking associated with each period.

In addition to the readings, students will be required to write in-depth compositions.

Note 1: Offered in 2007/2008 and every second year thereafter)

Note 2: This course is intended for Second, Third and Fourth-Year Arts students.

3- 0- 6

Credit(s): 1

FRF366A Étude de l'histoire et des formes de la poésie française du Moyen Âge à Baudelaire

The course is a study of the evolution of French poetry in Europe from the Middle Ages to Baudelaire, with emphasis on the 19th Century. The main trends and notable works will be examined in relation to the art and thinking associated with each period.

Note; Offered in 2006/2007 and every second year thereafter.

3- 0- 3

Credit(s): 1

FRF372A Théâtre médiéval et classique

This course will study medieval theatre, including farces and mystery, miracle and morality plays, French Renaissance theatre and classical theatre. (Corneille, Racine, Molière)

Note 1: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF373B Théâtre post-classique: XVIIIe et XIXe siècles

This course will study post-classical drama in France.(Beaumarchais, Marivaux, Hugo, Vigny, Musset, et al.) At the end of term, students will be able to identify the different esthetical and ideological trends in French dramatic literature of the XVIIIth and XIXth centuries.

Note 1: Offered in 2006-2007 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF375A Théâtre du XXe siècle

This course attempts to identify what it is that determines modernity in theatre, by examining a few texts--mostly dramatic, but some theoretical--that have marked the 20th century. At the end of the course, the student will know the major movements in theatrical aesthetics and make connections between dramatic, structural and thematic issues.

Note 2: For second-, third- or fourth-year art students.

3- 0- 6

Credit(s): 1

FRF376A**La littérature française du Moyen Âge I**

After a brief consideration of important social and historical elements and an overview of the principles of medieval French, this course will provide an intensive study of French medieval literature from its origins (Serments de Strasbourg) until the 13th century, dealing principally with the epic form (Chanson de Roland), the novel of courtly love and knightly quest (Romans de la table ronde, Roman du Graal) and with the beginnings of a new form of literature, that of the emerging classe bourgeoise. Various aspects of medieval life and customs (society, pastimes, food, war, clothing, etc.) will complement our studies.

Note 1: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF378B**La littérature française du Moyen Âge II**

This course follows FRF376A and addresses French literature of the 13th, 14th and 15th centuries. More specifically, we will be studying the inception of theatre as a literary form (religious plays, works of Adam de la Halle, Farce de maître Pathelin), various forms of lyrical poetry (chanson de toile, jeu-parti, etc.), and important longer works such as Le roman de Renart and Le roman de la rose. The end of the Middle Ages brings us to the work of the man considered to be the first modern French poet: François Villon.

Prerequisite: FRF376A

Note 1: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF380A**Les grands moralistes français des XVI^e et XVII^e siècles**

A study of the great French moralists of the 16th and 17th centuries, such as Montaigne, Pascal, La Rochefoucauld, La Bruyère, Vauvenargues.

Note 1: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF382B**Les grands moralistes français du XVIII^e siècle**

A study of the great French moralists of the 18th century, especially Voltaire, Rousseau and Chamfort, and their influence on 19th century literature.

Note 1: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF386A La littérature française du siècle des lumières I

An introduction to French thought and literature of the 18th century: the Age of Reason. Works of the great authors of this period will be studied: Fontenelle, Fénelon, Montesquieu (Lettres persanes, De l'esprit des lois) and Diderot (Le neveu de Rameau, Encyclopédie).

Note 1: Offered in 2007/2008 and every second year thereafter

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF388B La littérature française du siècle des lumières II

Continuation of FRF386A. This course will specifically look at the seminal works of the two most important writers of the period: Voltaire (Lettres philosophiques, Zadig, Candide, etc) and Rousseau (Discours sur l'inégalité, Contrat social, Émile, etc.)

Note 1: Offered in 2007/2008 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF392A Le roman comique au XVI e siècle

This course attempts to determine the social function of comedy, parody and satire. It begins with a study of the works of François Rabelais. These works will be examined as analysed by one of the greatest theoreticians of carnivalesque comedy, Mikhail Bakhtine.

Bakhtine characterizes the works of Rabelais as grotesque or carnivalesque. These works will be used to study the history and forms of comedy, the vocabulary of the public arena, festivals and grotesque portrayals of the human body.

Note: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF394B Le roman comique au XVIIe siècle

This course attempts to determine the social function of comedy, parody and satire. In the late 16th century, the carnivalesque style of Rabelais was continued by Michel de Cervantes and his *Don Quichotte de la Manche* and by Noël du Fail and his *Treize Propos rustiques*. The Roman comique and *Satyre Ménippée* by Scarron will also be studied. They are of a genre which Bakhtine calls grotesque or carnivalesque. These works will be used to study the history and forms of comedy, the vocabulary of the public arena, festivals and grotesque portrayals of the human body.

Note: The course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

4th Year

FRF405

Civilisation canadienne-française

The major currents of thought in French Canada are studied through an analysis of literary works.

Note: This course is intended for Second, Third and Fourth Year Engineering and Science students.

1.5- 0- 3

Credit(s): 1

FRF416A

Stylistique comparée de l'anglais et du français I

The course studies the linguistic, stylistic and cultural codes of the two languages, using translations of texts in the military field.

Note 1: Offered in 2006-2007 and every second year thereafter.

Note 2: This course is intended for French-speaking Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF418B

Stylistique comparée de l'anglais et du français II

The course studies the linguistic, stylistic and cultural codes of the two languages, using translations of texts in the military field.

Prerequisite: FRF416A or equivalent.

Note: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for French-speaking Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF426**Études dirigées avancées**

The course given on a tutorial basis by one member of the department involves the writing of a thesis.

Note 1: This course is intended for students in Fourth Year Honours French Studies. It must be approved by the Department Head.

3- 0- 6

Credit(s): 2

FRF440A/B**Vie et mort des grands héros de l'Antiquité**

A study of the ways in which Greek and Roman writers of antiquity represent great heroes. At the end of this course, students will be able to compare different antique models in relation to well-known myths. They will recognize and analyze the parameters by which wartime heroism is justified in the epics of Homer and Virgil, in the tragedies of Sophocles, Aeschylus and Euripides, as well as in the works of Plutarch, Lucan and Apuleius.

Note 1: Offered in January 2007 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF452A**Le roman canadien d'expression française avant 1940**

After its first tentative steps in the 19th century, the French-Canadian novel won acclaim in the 20th Century. This course provides an overview of this evolution.

Note 1: Offered in 2007/2008 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth-Year Arts students.

3- 0- 6

Credit(s): 1

FRF454B**Le roman canadien d'expression française après 1940**

The course provides an overview of the evolution of the French-Canadian novel after 1960.

Note 1: Offered in 2007/2008 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF462B**Pratiques littéraires des femmes**

Study of women writers in France and Quebec, taking into account theories of production and

reception, formal characteristics of the works and critical thought stemming from these practices. Students will be expected to place major authors and works in the context of literary history, to describe and analyze formal and aesthetic forces at work in these writings, and to formulate a personal critical reflection on women writers.

Note: This course is intended for Second, Third and Fourth year Arts students.

3- 0- 6

Credit(s): 1

FRF466A**La poésie des prédécesseurs**

This course will study the poetic works written in French Canada before 1937. It will show that the French-Canadian poetic tradition slowly distinguished itself from the literature of France and will study the characteristics of this new tradition. The works of the early 20th century will receive particular attention.

Note 1: Offered in 2006/2007 and every second year thereafter.)

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF468B**La poésie des aînés**

This course will study the works of Saint-Denys Garneau, Grandbois, Hébert et Lasnier. It will show that the works of these four poets have launched a new poetic language that will become a beacon for contemporary French-Canadian poetry.

Note 1: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF470A**Théâtre canadien-français I**

After an overview of the history of drama in French Canada, this course will study the real development of this literary genre from 1950 to 1970. The plays of some major playwrights will receive particular attention.

Note 1: Offered in 2007/2008 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF472B**Théâtre canadien-français II**

This course will study dramatic production in French Canada since 1970. It will show the diversity and originality of that production through the works of important playwrights.

Note 1: Offered in 2007/2008 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF482A**Civilisation canadienne-française de 1605 à 1900**

The major currents of thought in French Canada are studied through an analysis of literary works.

Note 1: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF484B**Civilisation canadienne-française de 1880 à nos jours**

The major currents of thought in French Canada are studied through an analysis of literary works.

Note 1: Offered in 2006/2007 and every second year thereafter.

Note 2: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF486A**Émergence d'une autonomie littéraire I**

This course will show that, from 1534 to the end of the 18th century, French-Canadian literature gradually laid the groundwork for the attainment of full literary autonomy in the 20th century.

Note : This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF488B**Émergence d'une autonomie littéraire II**

This course will show that, at the end of the 19th century and the beginning of the 20th, French-Canadian literature is trying to find solutions to fundamental problems of formal and thematic natures. The solutions arrived at will afterwards allow it to gain its full autonomy.

Note: This course is intended for Second, Third and Fourth Year students in Arts.

3- 0- 6

Credit(s): 1

FRF492A	La littérature de la francophonie antillaise et africaine
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This course will focus on the literature of Francophone communities outside France and Québec. It will trace the main stages in its development: the transition from oral to written expression, the opposition to Colonialism, emulation and affirmation of their difference. The purpose of the course is to prepare students to better understand other Francophone cultures.

Note: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF494B	La littérature de la francophonie nord-américaine et arabe
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The course will present works from the Acadian, Franco-Ontarian and Arabic literature.

Note: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF496A	La sociolinguistique et la francophonie I
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After presenting the various sociolinguistic trends, this course will focus mainly on the studies done on the standards, taboos and myths governing the different varieties of French.

Note: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

FRF498B	La sociolinguistique et la francophonie II
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The course will focus mainly on the most recent works in sociolinguistics and deals in particular with the different variants of French in specific areas (for example: the relationships between language and power and between language and social organization).

Prerequisite: FRF49A or equivalent.

Note: This course is intended for Second, Third and Fourth Year Arts students.

3- 0- 6

Credit(s): 1

ESF302A**Introduction to Spanish I**

It provides an introduction to the study of Spanish civilization and language.

This course is given in Spanish and French and requires a linguistic profile of BBB in French as a Second Language

Note: This course is intended for Second, Third and Fourth Year students.

3- 0- 6

Credit(s): 1

ESF304B**Introduction to Spanish II**

A continuation of ESF302A.

This course is given in Spanish and French and requires a linguistic profile of BBB in French as a Second Language

Prerequisite: ESF302A or equivalent.

3- 0- 6

Credit(s): 1

ESF402A**Intermediate Spanish I**

This course provides students with a furthering of their knowledge of oral and written Spanish and of Hispanic culture.

This course is given in Spanish and French and requires a linguistic profile of BBB in French as a Second Language.

Prerequisite: ESF302A or equivalent

Note: This course is intended for Fourth Year students.

3- 0- 6

Credit(s): 1

ESF404B**Intermediate Spanish II**

A continuation of ESF402A.

This course is given in Spanish and French and requires a linguistic profile of BBB in French as a Second Language

Prerequisite: ESF402A or equivalent

3- 0- 6

Credit(s): 1

History

1st Year

HIE102

Canada

An introduction to the history of Canada which traces some of the political, economic, social and cultural development and interactions which helped to create the modern nation of today.

Note 1: For students in the First year Arts.

Note 2: Students taking this course cannot also take HIE207A or HIE104 for credit.

3- 0- 6

Credit(s): 2

HIE104

Survey of Post-Confederation Canada

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

This course introduces students to the political, economic and social history of Canada from 1867 to the present. Particular emphasis is placed on the following themes: Canada in the North Atlantic World, the development of the Canadian state, the development of the Canadian economy and its impact on society, and the diversity of the Canadian experience and identity.

0- 0- 9

Credit(s): 1

DL

2nd Year

HIE202

Introduction to Canadian Military History

A survey of the military history of Canada from the early days of New France to the present. Emphasis will be placed on Canada's wars and their impact on national development. The evolution of Canada's Armed Forces, their role in the First and Second World Wars, in NATO, and in peacekeeping operations, will also be studied. Term one will cover the period to the end of the 19th century; term two will concentrate on the late 19th and 20th centuries.

Note 1: For students in the Second Year taking Arts.

Note 2: Students taking this course cannot also take HIE203B or HIF203B for credit.

3- 0- 6

Credit(s): 2

HIE203B

Introduction to Canadian Military History

A survey of the military history of Canada from the rise of New France to the present. Emphasis will be given to the evolution of the Armed Forces.

Note 1: Mandatory for students in Science, Engineering and Business Administration.

Note 2: Students taking this course cannot also take HIE202 or HIF202 for credit.

3- 0- 6

Credit(s): 2

HIE205	Canadian Military History: Origins to 1870
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Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

This course, which covers the pre-Columbian period to the beginning years of Confederation, introduces students to the most significant military organizations and events of the period, within their social and political context.

0- 0- 9

Credit(s): 1

DL

HIE207A	Canada
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A survey of Canadian history from the pre-Contact era to the 1980s. Key themes will include the diversity of the Canadian experience, Canada's place in the North Atlantic World, the development of the Canadian economy, and the evolution of the state as a force in the economic and social life of colonial and post-colonial Canada. The course will also explore how Canada's past has been presented in popular culture and public history.

Note 1: Mandatory for students in Science and Engineering.

Note 2: Students taking this course cannot also take HIE/F102 or HIE/F104 for credit.

3- 0- 6

Credit(s): 1

HIE208	Canadian Military History: A Study of War and Military History, 1867 to the Present
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Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

This course introduces students to the general themes of Canadian military history in the post-Confederation period. Particular emphasis is placed on the following topics: the evolution of the Canadian military since 1867; traditions and customs of the Canadian Forces; the evolution of the role of the Canadian officer and approaches to leadership since 1867; the relationship between Canadian

politics and society and the evolution of the Canadian military; the impact of changes in military arts and sciences and doctrine on operations and war fighting; and Canadian participation in joint and combined operations.

0- 0- 9

Credit(s): 1

DL + web

HIE270**An Introduction to Military History**

study of the evolution of strategy, war and conflict from Machiavelli to the present. It will include classical theories of battles and siegecraft; theorists of seapower and amphibious warfare; the impact of the industrial revolution on war; mechanized and mass strategy; armoured and aerial warfare; nuclear weapons policy; arms control and disarmament; and civil military relations. Examples of how these various aspects interconnect in warfare will be presented through an analysis of military conflict from 1400-1988.

Note1: Mandatory for students taking Honours or a Major History.

Note 2: Students taking this course cannot also take HIE271A/B for credit.

3- 0- 6

Credit(s): 2

HIE271A/B**Introduction to Military History and Thought**

This course is an introduction to military history and thought from the Napoleonic era to the present. In addition to an examination of the major (and some of the minor) conflicts of the era, the course will consider the impact of social and technological changes on the conduct of war. The student also will be introduced to the principal writers on themes and in military thought.

Note: Mandatory for all students who do not take HIE270.

3- 0- 6

Credit(s): 1

HIE272**A Brief History of Air Warfare**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

0- 0- 9

Credit(s): 1

DL

HIE275A/B Survey of Technology, Society and Warfare

This lecture course is a survey of the relationship between technology, society and warfare from the Napoleonic era to the present. Topics covered include the impact of the industrial revolution on warfare; technological developments and military doctrine during the two world wars and Cold War; the Revolution in Military Affairs; and emerging and evolving military technologies and doctrines. In studying these historical examples students will reflect on the major political, economic and social factors that inform the development of the technology and the role of technology in warfare.

Note: Students taking this course cannot take HIE475 for credit.

3- 0- 6

Credit(s): 1

HIE289A The Impact of Science and Technology on Society and the Environment

A lecture course on the impact of modern science and technology on society and the environment from the 16th century to the present. The focus is primarily on technology and social change and will consider technical or scientific knowledge in their wider economic, political and social context.

Note: Mandatory for students in Engineering.

2- 0- 4

Credit(s): 0.5

3rd Year

HIE301 Aboriginal Peoples in Canada: A History

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

Looking from the pre-contact era to the present, this course explores the history of Aboriginal Peoples in what is now Canada, with an emphasis on the historical relationship between Native and Non-Native groups. The course adopts a thematic rather than a chronological approach to the study of this relationship, and looks at themes such as military alliances, political relationships, civilization and education, culture and language, and Aboriginal Rights and Self-Government.

Prerequisite: A junior history course

0- 0- 9

Credit(s): 1

DL

HIE312A The United States, 1750 - 1877

A study of the political, social and economic development of the United States from the mid-18th century to Reconstruction.

Offered in alternate years

3- 0- 6

Credit(s): 1

HIE314B The United States, 1865 to the present

A study of the political, economic and social development of the United States from the American Civil War to the Reagan years.

Offered in alternate years

3- 0- 6

Credit(s): 1

HIE326 Selected Issues in History

This directed reading course is open to 3rd and 4th year Arts students (normally students in History) who wish to pursue a particular area of historical interest that is not available through regular departmental offerings. This will only be available in exceptional circumstances and requires the recommendation of a supervisor and the permission of the chair of the department.

3- 0- 6

Credit(s): 2

HIE332A/B War in Classical Age

This course aims to provide students with an introduction to war and diplomacy, as they evolved in the era of Ancient Greece and both Republican and Imperial Rome. Beginning with the foundation of powerful city states in Greece, it studies the first elements of Greek diplomacy and warfare. It then looks at the evolution of the military systems of the Greeks, as well as the diplomacy behind it, in the rivalry between the principal city states, the rise of Philip and Alexander of Macedon, and the wars of the Alexandrian succession. It would then move to a study of the diplomacy and war making of Republican Rome, its army and navy and its expansion into Italy, and wider conquests, especially in the Punic Wars, and the diplomacy, military control, and other factors behind the 'Pax Romana.' The evolution of the Roman Army over these key centuries will receive particular attention.

3- 0- 6

Credit(s): 1

HIE336A**The American Civil War**

No other event has marked the history of the United States so palpably. Even today, commentators and historians refer to Lincoln as one of the most important presidents the United States has ever elected, in particular due to the crucial role he played in this war and to his Emancipation Proclamation, which put an end to slavery. But there was more to this war. Among other things, it marked the end of pro-slavery rule in the South, the standardization of economic practices across the entire American territory for the first time, and the start of the second great wave of industrialization that would make the United States the greatest industrial power by the end of the First World War. We shall therefore cover the political, economic, social and military impact of this war.

3- 0- 6

Credit(s): 1

HIE340A**Military History of the First World War**

A study of the nature of total war at the beginning of the 20th century, including the origins of war, the process of strategic planning, the problems of coalition warfare, great battles on land, on the sea and in the air, propaganda, public opinion and espionage, technological changes and the social, political and economic consequences of war.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE342B**Military History of the Second World War**

Also offered through the Division of Continuing Studies as HIE342. Please refer to the [Division of Continuing Studies](#) for more information

A study of the nature of World War II, including the origins of war, the process of strategic planning, the problems of coalition warfare, great battles on land, on the sea and in the air, propaganda, public opinion and espionage, technological changes and the social, political and economic consequences of war.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE345**The Canadian Way of War**

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

This one semester course will examine the "Canadian" way of War in the colonial and early national period, by focusing on one particular campaign: the French Indian Wars, 1754-1760; the War of 1812; or the North West Rebellion of 1885. Students will examine the tactical, operational and strategic dynamics of a particular conflict through a combination of classroom lectures, presentations, discussions and an actual battlefield tour.

Note 1: Offered only periodically and with the permission of the Department.

Note 2: This special battlefield course is intended for officer professional development. It will be taught by a member of the faculty of RMC and by a field grade officer capable of applying current doctrine, terrain analysis and operational art to the historical study.

3- 0- 6

Credit(s): 1

HIE346A/B**The History of Canadian Forces Operations**

The Canadian Forces as an institution has participated in the widest variety of military operations types and deployed in more geographically diverse areas than any of its predecessor organizations in Canadian history. This course will trace the origins of the Canadian Forces in the 1960s and will examine how the CF conducted overseas operations, including policies and strategies for waging the Cold War, to UN peacekeeping and the era of intervention era in the early 1990s and the current Al Qaeda War.

3- 0- 6

Credit(s): 1

HIE356A**War and Tradition in the Islamic World**

A study of the rise of Islam and its enduring impact on Europe, Asia and Africa. Special attention will be paid to the roots of conflict in the Middle East, the Gulf and Indian Ocean states from the emergence of Islam to proclamation of the Turkish Republic in 1922.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE358B**War and Peace in the Modern Islamic World**

A study of war and peace in the modern Islamic World from the beginning of the Turkish Republic to the present. Attention will be paid to the political, military, economic and religious development of the Middle East, the Gulf and Indian Ocean states.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE369A The Diplomacy of Europe's Global Ascendancy: International History, 1815-1870

A lecture course concentrating on the major political, economic, and social developments in international history between 1815 and 1870. Emphasis will be placed upon the foreign policies of the European Great Powers, as well as the United States, China, and Japan, the advent of the Concert of Europe, the "Eastern Question", emerging colonial rivalries, differing national and imperial strategic requirements, and the impact of the German wars of unification.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE371 Introduction to War and Strategy

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

This course is an introduction to and discussion of western strategic thinking in the nineteenth and twentieth centuries. Strategic thinking and theorists in all three elements (land, sea, and air), as well as imperialism, technological change, anti-colonialism and terrorism, nuclear weapons theory and unconventional warfare are discussed. The course analyzes various combinations of industrial power, public opinion, military power, intelligence processes, economic strength, and foreign policy a country uses to create a military "strategy."

Prerequisite: A junior history course

Note: Students cannot take both HIE/F371 and either HIE/F270 or HIE/F271

0- 0- 9

Credit(s): 1

DL + web

HIE372B The Diplomacy of Great Power Rivalry: International History, 1870-1914

A lecture course concentrating on the major political, economic, and social developments in international history between 1870 and 1914. Emphasis will be placed upon the foreign policies of the European Great Powers, as well as the United States and Japan, the rise and development of the European Alliance system, colonial rivalries, differing national and imperial strategic requirements, and the origins of the First World War.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE374A From World War to World War: International History 1914-1945

A lecture course concentrating on the major political, economic and social developments in international history between 1914 and 1945. Emphasis will be placed upon the origins of the First World War, the development of war aims and peace terms, inter-alliance relations, the Paris Peace Settlement, interwar diplomacy, the "appeasement" debate, and the diplomacy of the Second World War.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE377A/B The Cold War

The Cold War had both lasting military and social impact. The Cold War was the only sustained conflict in history that had the potential to end life on earth with mass nuclear weapons use. It was a conflict that had its own unique methods of fighting, from the intelligence war and covert action to space and even sporting events. This course will examine how the war was fought between the superpowers, and the dramatic influence it had on numerous regional conflicts from 1945 to 1990 as well as on Western society and culture.

3- 0- 6

Credit(s): 1

HIE379B Cold War, Limited War, and Diplomacy: International History, 1945 - 1991

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

A lecture course concentrating on the major political, economic, and social developments in international history after 1945. Emphasis will be placed upon the settlements following the Second World War, the reconstruction of Europe and the Far East, and the formation of NATO and the Warsaw Pact. The origins of the Cold War, the rise of the global Super Powers, the end of European hegemony overseas, the trend towards European integration, and the emergence of the Third World as an effective factor in international politics will also be discussed.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE380 Peacekeeping and Peacemaking

A study of peacekeeping and peacemaking operations in the 20th century from the Boxer Intervention of 1900 to the present. Operations taken under the auspices of the League of Nations and the United Nations will be analyzed as well as those endeavours involving cooperation between alliance or coalition partners. Special attention will be paid to the roles and the missions undertaken by the Canadian Armed Forces in the post-1945 era.

3- 0- 6

Credit(s): 2

HIE382 An Introduction to Issues in Peacekeeping and Peacemaking

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

0- 0- 9

Credit(s): 1

DL

HIE384 Modern Europe

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

A survey of European history from 1500 to the present. This course examines the political, social and economic history of Europe over the past five hundred years. Special attention will be paid to such wider phenomena as the Renaissance, the Reformation, the Enlightenment, the Industrial Revolution, colonialism and the impact of war.

Note 1: Mandatory for students taking Honours or a Major in History.

Note 2: Students majoring in history are strongly encouraged to take this course in their second year.

3- 0- 6

Credit(s): 2

HIE385 Modern Britain

A survey of British history from 1750 to the present. In addition to examining the course of British political history, particular attention will be paid to the industrial revolution and urbanization, Britain's extra-European dimension, Britain's role as a great power and the contraction of British influence in the second half of the twentieth century. (It is recommended that HIEF384: Modern Europe, be taken prior to this course.)

Offered in alternate years.

3- 0- 6

Credit(s): 2

HIE386A**Eastern Europe to 1918**

A study of the history of East Central and Eastern Europe - the lands between the German and Russian realms - from medieval times to the end of the First World War. Aside from examining the evolution of the major national groups of the region, the course will cover such themes as international conflict in the region, the struggles for national liberation, the impact of industrialization, the rise of nationalism.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE387A**Russia to 1917**

A survey of Russia from 1861 to the Revolution of 1917. Particular attention will be paid to the emancipation of the serfs, the industrialization of Russia, the modernization of government and the Bolshevik revolution. (It is recommended that HIE384: Modern Europe, be taken prior to this course.)

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE388B**Eastern Europe from 1919 to 1989**

The evolution of Eastern Europe from the post-World War I peace settlements to the collapse of the Soviet Empire. The course will survey the newly emerged independent states after 1918; internal problems and foreign interference in the region; social, ethnic, and intra-regional conflicts; the impact of World War II; the rise and demise of Soviet-style communism. (It is recommended that HIE386A: Eastern Europe, be taken prior to taking this course.)

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE389B**The History of the USSR**

A survey of the USSR from 1917 to the present. Particular attention will be paid to the Stalinist system, the role of the USSR as a great power, the Second World War and the collapse of

Communism. (It is recommended that HIE486A: Russia to 1917, be taken prior to this course.)

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE390A European Imperialism - The Early Stages in Renaissance Europe

An introduction to the early expression of European Imperialism in the 15th, 16th and 17th centuries, and particularly the Spanish and Portuguese experience. In addition, the formation of the first British Empire, to 1783 and the French Imperial experience to 1759 will be considered and contrasted with that of the Netherlands.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE392B European Imperialism - Nineteenth and Twentieth Centuries

An examination of the phenomenon of modern European imperialism, concentrating on the British and French Empires. The growth of colonial nationalisms and the emergence of independence movements within those empires will also be considered. (It is recommended that HIE390A: European Imperialism, be taken prior to or coincident with this course.)

Offered in alternate years.

3- 0- 6

Credit(s): 1

4th Year

HIF400 L'héritage militaire du Canada français

A study of the relationship between French Canadian society, the Armed Forces and war. Themes discussed will include Pierre Lemoyne d'Iberville, the "compagnies franches de la Marine", Charles-Michel de Salaberry, the Van Doos, the 425th Squadron, the implementation of bilingualism in the Canadian Forces and other aspects of 350 years of French Canadians and Quebecers soldiering.

Offered in alternate years.

3- 0- 6

Credit(s): 2

HIE403B	Social History of Canada (1870-1980)
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This seminar will analyse selected issues in the development of Canada from 1870 till 1980. Topics will include industrialization, immigration, social movements, reform, urbanization, regionalism, cultural conflict, social effects of war and the changing cultural definitions of Canada.

3- 0- 6

Credit(s): 1

HIE405A	History of the relations between Canada and the United States
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An analysis of various themes in the Canadian-American relationship from the beginning of European colonization until the present. Based on readings and discussion in class. The course will consider the mutual influences exercised by these two countries on their respective political, economic, social, cultural and intellectual development.

3- 0- 6

Credit(s): 1

HIE406A	Canadian External Relations
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Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

A study of selected aspects of the history of Canadian foreign policy, including studies of Canada's role within the Empire-Commonwealth, North America, Europe, Asia and the Third World.

3- 0- 6

Credit(s): 1

HIE408B	Canadian Defence Policy
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Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

A study of selected aspects of Canadian defence policy including the development of the modern military force and its role in military operations; an examination of domestic and international factors influencing the formulation of defense policy and the use of the armed forces as an instrument of national policy.

3- 0- 6

Credit(s): 1

HIE410**Canada and War**

An examination of the impact of modern wars on Canadian society from 1860 to the present. Specific themes will include Canadian reaction to North American conflicts and to British imperial wars; the impact of World War I and II; Canada and Cold War and Canada and peacekeeping.

Offered in alternate years.

3- 0- 6

Credit(s): 2

HIE416A**The United States as an Emerging World Power to 1919**

A thematic study of the United States and its relations with foreign powers from the early national period to the end of World War I. Issues that will be considered will include the development of a continental nation, the foreign policy consequences of industrialization and America's growing involvement in international affairs.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE418B**The United States as a World Power, 1919 to the Present**

This course will consider, through a combination of lectures and seminars the actions of the United States as a World Power. Themes and topics discussed will include the tension between isolationism and international commitments and the interplay of foreign policy and domestic developments. (It is recommended that HIE416A: The US as an Emerging World Power to 1919, be taken prior to this course.)

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIE420**Making a New World: Colonial Societies in North America**

A study of the development of French and English colonial societies in North America from the 16th century to about 1840. Class discussions will consider, among other things the development of New France, Acadia and the English colonies on the continent before 1776 and the changing face of British

North America.

Offered in alternate years.

3- 0- 6

Credit(s): 2

HIE421	Canadian Naval History
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Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

This seminar course examines the history of the Canadian navy since 1910. The course is divided into three periods: the formative years (1910-1945); the Cold War era (1945-1990), during which the Canadian navy came of age; and the post-Cold War period (1990-present). In exploring these periods, students will reflect on 1) how Canadian naval policy has changed over time; 2) the development and application of new technologies within the Canadian navy; 3) and Canadian naval operations in wartime and peacetime

0- 0- 9

Credit(s): 1

DL

HIE422A	Naval History. The Age of Sail
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A survey of naval and maritime history from the 16th to the early the 19th century. The broad themes addressed include organizational, technological and social developments impinging upon the conduct of naval operations, and the course of maritime commerce. In addition, selected aspects of the "world wars" of the 17th and 18th centuries will be examined to illustrate transitions in technology, tactical doctrine, and major strategic debates.

3- 0- 6

Credit(s): 1

HIE423B	Naval History: The Age of Steam
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A survey of naval and maritime history from the mid 19th through the 20th centuries. The broad themes addressed include organizational, technological and social developments impinging upon the conduct of naval operations, and the evolution of modern navies to the nuclear age. In addition, selected aspects of the "world wars" of the 20th century will be examined to illustrate transitions in technology, tactical doctrine, and major strategic writers and debates.

3- 0- 6

Credit(s): 1

HIE424**Thesis**

Special research on an approved subject to be prepared as a thesis, which will be examined by a committee constituted for the purpose. The thesis must be submitted for examination no later than 31 March. (Taken only with permission of the Department.)

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Credit(s): 2

HIE426**Advanced Directed Studies**

Special research on an approved subject, under the direction of an instructor, resulting in the submission of at least 2 major research papers. (Taken only with permission of the Department.)

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Credit(s): 2

HIF432**Histoire diplomatique et militaire de l'Amérique latine**

An introduction to the diplomatic and military influences which affected the development of Latin America. Among other things, the course will consider pre-contact indigenous societies, and how various wars have influenced the state of modern society.

Offered in alternate years.

3- 0- 6

Credit(s): 2

HIE444**History of intelligence since 1870**

Using historical case studies from the Franco-Prussian War onwards, this course examines the methodologies of intelligence operations, including issues of deception, human and technical intelligence gathering, counter-intelligence, and more. These case studies will include the operations of a number of states including the United States, Great Britain, France, Prussia/Germany, Tsarist/Soviet Russia, and Israel.

3- 0- 6

Credit(s): 2

HIE448 The Rise of Modern Communism and Fascism

A thematic examination of the emergence and triumph of radical leftist or right-wing movements in Russia, Italy, and Germany. The intellectual and populist origins of communism, fascism and Nazism, the national and international context of the evolution of these movements, and other related themes will also be studied. (It is recommended that HIE/F384, Modern Europe, be taken prior to or coincident with this course.)

Offered in alternate years.

3- 0- 6

Credit(s): 2

HIE454 War, Peace and Diplomacy: Issues in the Foreign Policies of the Great Powers since 1815

A seminar course on the conduct of Great Power relations since the Congress of Vienna in which students will investigate various themes and topics in international history since 1815. The themes and topics will include: personality and policy-making; the diplomacy of the First and Second World Wars; civil-military relations and the development of national strategy; disarmament and peace-making; the early Cold War; and the later Cold War.

Offered in alternate years.

3- 0- 6

Credit(s): 2

HIF455A Les origines historiques des crises de notre temps

This seminar examines the historical background of selected world crises. Relying on a combination of primary and secondary sources, it will analyse how economic, ethnic, social, cultural, military and diplomatic factors have shaped over time the policies of the nations involved in these crises.

3- 0- 6

Credit(s): 1

HIE456 Issues in Women, War and Society

An exploration, through seminars of selected themes and issues in the history of women, war and society from the 17th century to the present. Particular attention will be paid to women's changing involvement in war and revolution in the 18th and 19th century; the rise of ¿modern¿ military institutions; women's involvement in World War I and II; debates about gender integration in the late 20th century.

Offered in alternate years.

3- 0- 6

Credit(s): 2

HIF460A**La Révolution française**

A study of causes and the main events of the French Revolution through the popular days: 14 July, 5 and 6 October, 10 August, 31 May etc.. The course will also consider the dialectic between the popular movement and the bourgeois reaction and concerns over human rights. The students will give presentations and critique primary documents of the revolution.

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIF462B**Napoléon et le Premier Empire**

This course will consider the first empire and the rise of imperialism. It will consider the seven coalitions raised by England and the grand battles of the regime: Aboukir, Trafalgar, Austertitz, Wagram and Waterloo. Students will analyse the continental blockade, the war in Spain, the Russian campaign, the campaign in France and the congress of Vienna, and its attempts to stop the emperor and the destruction of the French Revolution.

Offered in alternate years

3- 0- 6

Credit(s): 1

HIE470**Strategy and Strategists**

A study of the most important interpreters of warfare from classical thinkers (Thucydides and Sun-Tzu) to the present. Also considered will be airpower and its proponents; geopolitical and maritime doctrines of war; the developments of military technology since 1945 and their impact on strategic thinking; the theories of deterrence, revolutionary and guerilla war; disarmament and arms control and the international law of war.

3 - 0- 6

Credit(s): 2

HIE471B**History of Air Warfare**

This seminar course will explore air power and air warfare from the earliest days of powered flight to

the present. It will focus primarily on the development of the idea of air power and on the organization and employment of air power and aerospace power in war and peace. The major themes that will be explored will include: the unique attributes of air power; the importance of air superiority; the contrast between offence and defense in air warfare; the role of "auxiliary aviation"; the command relationship between air and surface forces; and the morality and legality of air warfare.

3- 0- 6

Credit(s): 1

HIE474A	Military Technology: Men, Machines and War
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Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

An examination of the impact of technology on war, and the relation of these to society as a whole. In addition to identifying the key technological advances in weapon development and defence-related fields, this course will look at the effect of technology on tactics, strategy, and society itself, from the pre-gunpowder period to the nuclear age.

3- 0- 6

Credit(s): 1

HIE475	Technology, Society and Warfare
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Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information

The relationship between technology and warfare is undeniable: from the Great War (1914-18) to the War on Terrorism today, technology has played a central role in military operations. In this course students will define and analyze technology as a general concept and its relationship to warfare in particular. Students will also reflect on the factors-political, economic, cultural, etc.-that contribute to the creation of technology and that determine its use in warfare. The course will examine the principal developments in military technology from a historical perspective, beginning with the development of artillery in the fifteenth century and ending with an analysis of the contemporary and future battlespace.

Prerequisite: A junior history course

0- 0- 9

Credit(s): 1

DL + web

HIE476B	Guerrilla and Revolutionary War
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A study of the role and conduct of guerrilla warfare and its connection with other types of conflicts. This course will trace the development of thinking about guerrilla warfare as well as the evolution of

its practice.

3- 0- 6

Credit(s): 1

HIE477B	An Introduction to the History of Terrorism
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This is an introduction to terrorism and counter-terrorism in a variety of historical contexts. Among other things, it will consider the origins, complexities and basic elements of terrorism, as well as the various approaches taken to control this "poor man's weapon".

3- 0- 6

Credit(s): 1

HIE480	War, Revolution and the Rise of Modern China
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A study of the transformation of China from cultural Empire to a modern state. Particular attention will be given to the indigenous response of China to the impact of the West. Emphasis will be given to the influence of war and revolution on the development of China from the early 19th century to the present.

Offered in alternate years.

3- 0- 6

Credit(s): 2

HIE482	War and the Emergence of Modern Japan
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A study of the impact of war and the military ethos on the emergence of Japan as a world power. Attention will be paid to bushido and the samurai, the evolution of modern armed forces, military education, the general staff, the military-industrial complex, civil-military relations, the military and colonial policy, and alliance diplomacy.

Offered in alternate years.

3- 0- 6

Credit(s): 2

HIE484	Themes in Modern History
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This course is designed to facilitate the special expertise of visiting Professors to teach in their area of expertise. Each course will have a distinct theme reflecting that expertise and the subject of the course,

if offered, will be published at the time of student registration. The course will be an advanced seminar and open only to history and MSS majors and honours students. Students may only take this course once.

3- 0- 6

Credit(s): 1

HIF491A**Les crises internationales et le droit**

An historical examination of origins, development and resolution of a number of major international crises, including the Falklands War (1982), flight KE007 (1983), the taking of American hostages in Tehran (1979), the Rainbow Warrior bombing (1985), the Achille Lauro hijacking (1985), the Iraq-Kuwait War (1990) and the Palestinian issue (2000). In particular, students will consider and analyse the legal positions of the parties involved, their actions during the crisis and the contribution of the law to solving the problem.

3- 0- 6

Credit(s): 1

HIF492B**Crimes et criminels de guerre: Droit pénal international**

A study of war crimes, crimes against humanity, and of the reactions of the international community. This will include a review of the principles developed from the Nuremberg, Tokyo, The Hague and Arusha Tribunals; a study of the Goering, Yamashita, Eichmann, Barbie, Lischka, Calley, Finta, Demjanjuk, Papon and Blaskic trials; and an examination of the international penal court project.

Offered in alternate years

3- 0- 6

Credit(s): 1

HIF494A**La France moderne jusqu'à 1848**

Political, economic, social and cultural developments in France from the Middle Ages to 1848, with emphasis on the growth of royal absolutism, the French Revolution and the subsequent quest for political stability to 1848. The role of France in the European context will be explored, as well as its military institutions. (It is recommended that HIE/F384, Modern Europe, be taken prior to or coincident with this course.)

Offered in alternate years.

3- 0- 6

Credit(s): 1

HIF496B**La France contemporaine**

A study of the political, economic, social and cultural developments in France from 1848 to the present. Among other things, the course will consider the political, military and cultural development in France since the second Republic and the repercussion of the great wars of the 20th century. (It is recommended that HIF494A, La France moderne jusqu'à 1848, be taken prior to this course.)

Offered in alternate years.

3- 0- 6

Credit(s): 1

Military Psychology & Leadership

1st Year

PSE112	Introduction to Psychology
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This course is designed to provide the student with an understanding of people as psychological beings and to establish the foundation for future required MPL courses. Concepts such as neuroscience and behaviour, development, sensation and perception, learning, memory, motivation, personality, intelligence, and psychological disorders will provide the student with an enriched background for future study. Additionally, a comprehensive treatment of the major topics and issues in social psychology is included. Various aspects of social thinking, social influence, and social relations are examined and their impacts on military leadership is discussed.

Compulsory for all students in the First Year Arts.

3- 0- 6

Credit(s): 2

PSE123B	Fundamentals of Human Psychology
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Also offered through the Division of Continuing Studies as PSE123. Please refer to the [Division of Continuing Studies](#) for more information.

This course introduces the student to the basic concepts of modern psychology with emphasis on personality, and social psychology, thereby providing the foundation for future required psychology courses. It includes the essentials of the scientific method and its application to psychology. The first half incorporates the basic concepts of people as psychological beings (e.g., learning, emotion, intelligence) followed by emphasis on fundamental social psychology elements (e.g., attitudes, group behaviour, social influence).

Compulsory for all students in the First Year Science/Engineering Programme.

3- 0- 3

Credit(s): 1

PSE192	Directed Readings in Psychology
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The content of this course is more advanced than that of PSE112, and is related to the studies already completed by the student.

Directed Reading Only

Available, upon permission of the Department Head, to First Year Arts students repeating First year without previous failure in PSE112.

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Credit(s): 2

2nd Year

PSE205A/B**Social Psychology**

This course provides a comprehensive treatment of the major topics and issues in social interaction. The course will emphasize the unique contribution of social psychologist to the theory of social behaviour in such areas as social beliefs and judgments, behaviour and attitudes, attitude change, culture and gender, conformity and obedience, persuasion, prejudice and discrimination, aggression, and social conflict and peacemaking. Students will apply theories and concepts of social psychology to the analysis of the military and social milieu.

Prerequisite: PSE/F112 or PSE/F123B

For students in Second, Third or Fourth Year.

3- 0- 6

Credit(s): 1

PSE213A/B**Statistics for the Behavioural Sciences**

This course applies statistical concepts to the behavioural sciences. Students will peruse and understand such concepts as measures of central tendency, measures of dispersion, and the normal distribution. They will determine relationship between data and apply models related to prediction. Hypothesis testing involving dependent and independent data will be introduced and will lead to simple two-way analysis of variance. The course will conclude with an introduction to non-parametric statistics.

Note: A required course for the students electing a BA in Psychology

3- 0- 6

Credit(s): 1

PSE214A/B**Research Methodology in Psychology**

This course takes a broad approach to research methods in the behavioural sciences. Students are introduced to basic concepts in experimental design and statistical analysis of psychological data. More specifically, students are taught how to obtain reliable and valid measures of human behaviour and psychological attributes. Insights into methodological issues related to the study of psychological phenomena in applied contexts are gained through having students design simple research projects.

Prerequisite: PSE/F112 or PSE/F123B

For students in Second and Third Year Arts.

3- 0- 6

Credit(s): 1

PSE 236A/B**Cognition and Learning**

This course is concerned with the basic mental processes involved in learning and information processing. Topics include the basic and fundamental processes involved in learning and in cognition, including mind design, cognitive aspect of learning theories, attention, short-term and long-term memory, and higher mental processes of knowledge and language. Students will use concepts of decision-making to analyze military situations.

Prerequisite(s): PSE/F112 or PSE/F123B

For students in Second, Third or Fourth Year.

3- 0- 6

Credit(s): 1

3rd Year

PSE301A**Organizational Behaviour and Leadership**

Also offered through the Division of Continuing Studies as PSE301. Please refer to the [Division of Continuing Studies](#) for more information.

This course is designed to familiarize students with basic theories, concepts, and skills related to organizational behaviour and effective leadership. Students will examine how individuals in organizations, groups in organizations, and organizational processes can be impacted by leaders in order to enhance organizational effectiveness. A special emphasis is placed on how leaders can use their knowledge and understanding of organizational behaviour to improve performance and increase the well-being of members. Major topics include motivation theories and applications, diagnosing performance discrepancies, performance feedback, power and influence, leadership theories and applications, organizational culture, organizational structure, and overall change strategies. Part of the material will be presented in a didactic form. A number of individual and group exercises will be used as a supplementary learning tool to reinforce class lectures and assigned readings. Student class participation is highly encouraged.

PSE/F112 or PSE/F123B

Compulsory for all students in the Third Year.

3- 0- 3

Credit(s): 1

PSE306A/B**Human Resource Management**

The basic purpose of every human resource system is to acquire, develop, and maintain the right kinds and numbers of people necessary to achieve organizational objectives. Taking a general systems approach, this course examines the major human resource management (HRM) functions and their

impact on organizational effectiveness. Extensive reference is made to the Canadian Forces personnel system to illustrate points of discussion. Representative topics include: demographics and personnel supply; human rights legislation and employment equity; human resource planning; recruiting and selection; training and development; quality of working life; occupational stress; and assessing the utility of HRM activities.. Students will be expected to demonstrate their comprehension of relevant HRM issues by completing projects in these areas.

Prerequisite: PSE/F112 or PSE/F123B

For students in the Third or Fourth Year.

3- 0- 6

Credit(s): 1

PSE312A/B**Applied Military Psychology**

Also offered through the Division of Continuing Studies as PSE312. Please refer to the [Division of Continuing Studies](#) for more information.

The course gives students the opportunity to examine the psychological dimensions of military operations. The course begins with an overview of the field of military psychology and then focuses on selected topics like military socialization, combat stress, sleep deprivation, fear and courage, and psychological operations. At the end of the course, students will be able to describe the impact of these psychological factors on performance during military operations.

Prerequisite: PSE/F112 or PSE/F123B

3- 0- 6

Credit(s): 1

PSE320A/B**Sociology of the Armed Forces**

This course uses perspectives and research from military sociology to introduce the student to the evolving character of military institutions within Canada. The following topics will be covered: the nature and role of the military in contemporary society, external change impacts (e.g., technological, political, economic, demographic, socio-legal and socio-cultural factors) and their consequences for military organization, models of military service, and special problems in the military system (e.g., recruitment and retention, diversity, media relations, the family, quality of life, mid-career transition). Emphasis will be placed on the Canadian military and on Canadian research literature.

Prerequisite: PSE/F112 or PSE/F123B

Not offered every year. For students in the Third or Fourth Year Arts. Elective for students taking a minor in Psychology.

3- 0- 6

Credit(s): 1

PSE324A/B**Cross-Cultural Psychology**

Modern military operations typically involve multinational contingents comprised of units from a wide variety of cultures. The purpose of the course is to gain an understanding of the diversity that exists in the world and within Canada. This course provides an overview of some of the differences that exist across cultures and why these differences may exist. Topics to be covered include acculturation, stereotypes, prejudice, cross-cultural research, values, beliefs, gender roles, conflict and negotiation, communication, and intercultural training.

Prerequisite: PSE/F112 or PSE/F123B

Note 1: Not offered every year

Note 2: For students in Second, Third, or Fourth-Year Arts.

3- 0- 6

Credit(s): 1

PSE328A/B**Group Dynamics**

Also offered through the Division of Continuing Studies as PSE328. Please refer to the [Division of Continuing Studies](#) for more information.

The objective of the course is to enable students to develop an understanding of small group processes, particularly influences that groups have on individual members, as well as those factors which determine group effectiveness. The principal topics to be addressed are: the stages of group development; socialization processes; communication; decision-making process; and, group norms, cohesion and role definition.

Prerequisite: PSE/F112 or PSE/F123B

For students in Second Year and Third Year Arts.

3- 0- 6

Credit(s): 1

PSE332A/B**Introduction to Interviewing and Counseling**

The goal of this course is to introduce students to counseling theory and skills that they can later apply as leaders and managers. This course will give students an opportunity to study theoretical perspectives on counseling and to apply these theories in situations that require interviewing and helping skills. After examining a number of theoretical concepts in counseling, the course will focus on the preparation and conduct of counseling interviews, solution-oriented interviews, active listening, verbal and non-verbal communication, problem solving and facilitating attitudes used in counseling interviews. A mix of psychological theory, case studies and practical applications will be presented throughout the course.

Prerequisite: PSE112 or PSE123B

For students in the Third or Fourth Year Arts.

3- 0- 6

Credit(s): 1

PSE346A/B**Persuasion and influence**

The goal of this course is to provide students with knowledge on the theories and concepts of persuasion and influence, from both social psychology and leadership perspectives. Main course topics include communicator's characteristics, receiver's characteristics, cognitive and social factors, attitude formation and change, behaviour modification and interpersonal communication. Also, different influence strategies will be presented.

Prerequisite: PSE/F112 or PSE/F123B

Not offered every year. For students in the Third or Fourth Year. Elective for students taking a minor in Psychology.

3- 0- 6

Credit(s): 1

PSE352A/B**Advanced Statistics for the Behavioural Sciences**

This course follows Statistical Analysis for Social Scientists I (ECE270A). This course addresses the theoretical concepts and applications of multivariate statistical techniques in the behavioural sciences. Statistical analyses covered include factorial analysis of variance, multiple regression and correlational techniques. Students will be introduced to the use of statistical tools, data manipulation and the interpretation of results in representative behavioural science research topics.

Prerequisite: PSE/F214A/B and ECE/F270A

For students in Third or Fourth Year.

3- 0- 6

Credit(s): 1

4th Year

PSE401B**Military Professionalism and Ethics**

The purpose of this course is to develop student understanding of the professional and ethical dimensions of officership. Throughout, a distinction is made between the normative ideals of behaviour prescribed by ethical and military theorists and the reality of behaviour as described and explained by cognitive, social, and other psychological factors. Course content is drawn from moral philosophy, psychology, and military sociology and includes readings and discussions on: the function of ethics in social and organizational life; the major ethical theories and decision frameworks

developed by moral philosophers to distinguish between right and wrong; individual difference factors in moral development and moral cognition; situational and organizational factors which either foster or undermine ethical behaviour; psychological models of ethical decision-making and action; the nature of military professionalism and the ethical obligations which derive from the military's social role and legitimate power; the military ethic and military codes of conduct; specific codes of conduct applicable in war; and value conflicts and ethical dilemmas inherent in military service.

Prerequisite(s): PSE/F112 or PSE/F123B, PSE/F301

Compulsory for all students in the Fourth Year.

3- 0- 6

Credit(s): 1

PSE402 Leadership and Ethics

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course discusses the professional, ethical, and leadership issues associated with commissioning. It is designed to introduce students to the ethical dimensions of the profession of arms and the underlying theoretical leadership theories that enhance individual and group performance, and to models of effective decision-making. The course includes readings and discussions on the major ethical theories and decision frameworks distinguishing right from wrong, the nature of military professionalism and the ethical obligations, the foundations of professional military ethics, individual difference factors in moral development, situational factors that foster or undermine ethical behaviour, psychological models of ethical decision-making and action, motivation theories and applications, power and influence, group dynamics and team building, leadership theories and applications, and decision-making models. Students are encouraged to demonstrate their understanding and integration of the material through assigned readings and case study analyses.

Exclusion: Students taking this course cannot take PSE/PSF401 for credit.

0- 0- 9

Credit(s): 1

DL + web

PSE424 Thesis

Special research on an approved subject that, usually, includes statistical analyses and results interpretation. This thesis will be examined by a committee constituted for the purpose. (Taken only with permission of the Department).

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Credit(s): 2

PSE444A/B**Sport Psychology**

This course introduces the student to the psychological and social factors inherent in sport and exercise. Topics will include understanding participants (e.g., personality, motivation, stress); understanding sport and exercise environments (e.g., competition, feedback, reinforcement); understanding group processes (e.g., team dynamics, cohesion, leadership); enhancing performance (e.g., imagery, goal setting, concentration); improving health and well-being (e.g., athletic injuries and psychology, addictive and unhealthy behaviors, burnout and overtraining). This course will provide students with a greater understanding of the psychological dimensions of sport, exercise and health, and then be better prepared to implement this knowledge in military settings.

Prerequisite(s): PSE/F112 or PSE/F123B, PSE/F301A

For students in Third or Fourth-Year.

3- 0- 6

Credit(s): 1

PSE452A/B**Advanced Research Methods in the Behavioural Sciences**

This course provides detailed coverage of key concepts and practices related to conducting applied behavioural science research in an institutional setting. Four sections are presented. The first addresses the development and definition of a research proposal to ensure that research is based on sound theoretical and conceptual bases. The second involves the ethical and administrative considerations for data collection to ensure that research will generate valid, relevant results in accordance with ethical standards and institutional requirements. The third covers the collection, coding and statistical treatment of data with particular attention to maintaining confidentiality. The final section focuses on the interpretation and presentation of results with an emphasis on consideration of the differences between academic and organizational audiences.

Prerequisite: PSE/F352A/B (Advanced statistical .)

For students in Fourth Year who have been admitted to the Honours programme.

3- 0- 6

Credit(s): 1

PSE454A/B**Advanced Leadership**

The general objective of this course is to explore leadership theory and practice in depth, building on the concepts introduced in PSE301A, and secondly, to develop an appreciation of how these impact on work performance and motivation. The general focus will be on the critical analysis of current leadership theories and their application to the military. Students will also be introduced to diagnostic and intervention strategies related to organizational development and to the leader as an agent of change. Ultimately, the student will be able to evaluate work situations and employ strategies to increase personnel performance and improve motivation and job satisfaction.

Prerequisite(s): PSE/F112 or PSE/F123B, PSE/F301A

For students in Third or Fourth Year.

3- 0- 6

Credit(s): 1

PSE462A/B**Human Factors in Applied Military Science**

This course will introduce students to the broad problems in human-machine interactions and interfacing. This will involve studying human capabilities as applied to engineering and design. Topics will also include the measurement of human and machine capabilities, the effects of noise on performance, and the effects of sustained operations on performance. The various techniques used to enhance human effects of sustained operations on performance. The various techniques used to enhance human performance will also be discussed and evaluated. Aids to memory, perception, discrimination, and detection will be examined and demonstrated in class. Students will also be introduced to the use of computers in psychological settings.

Prerequisite(s): PSE/F112 or PSE/F123B, PSE/F214A, PSE/F301A

For students in the Third or Fourth Year Arts.

3- 0- 6

Credit(s): 1

PSE464A/B**Directed Studies in Military Psychology**

With permission of the department head, specialized study on an approved subject in one of the areas studies in Military Psychology, but not available in other courses offered by the department. The method of instruction (i.e., lecture, seminar, tutorial, directed reading, etc.) will be determined by student needs and faculty availability.

Directed Readings Only

Prerequisite(s): PSE/F214A/B, PSE/F301A

For students in Third or Fourth Year.

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Credit(s): 1

PSE466A/B**Directed Studies in Sociology of the Armed Forces**

With permission of the department head, Specialized study on an approved subject in one of the areas studies in Sociology of the Armed Forces, but not available in other courses offered by the department. The method of instruction (i.e., lecture, seminar, tutorial, directed reading, etc.) will be determined by student needs and faculty availability.

Directed Readings Only

Prerequisite(s): PSE/F214, PSE/F301A

For Students in 3rd and 4th year

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Credit(s): 2

Politics & Economics

1st Year

ECE102**Elements of Economics**

This course is designed as an introduction to the fundamental building blocks of economic analysis. Choices made by consumers and producers are shown to give rise to demand and supply. The role of the price system providing information and incentives is discussed. Various public policies, particularly price controls and taxation, are used to motivate the analysis of demand and supply as well as the need to measure changes in demand and supply. National income accounting and the terminology used in macroeconomics are presented together with actual data for the Canadian Economy. The way in which fiscal and monetary policies can be implemented and their potential effects on the macro economy are discussed.

For students of the First Year taking Arts.

3- 0- 6

Credit(s): 2

ECE103**Elements of Microeconomics**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is an introduction to the methods of economics, the central problems of every economic society, the elements of supply and demand, the functions of the price system, the theory of production, and the firm.

0- 0- 9

Credit(s): 1

DL

ECE104**Elements of Macroeconomics**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is an introduction to Macroeconomics: national income accounting and the terminology used in macroeconomics are presented together with actual data from the Canadian economy. The way in which fiscal and monetary policies can be implemented and their potential effects on the macro economy are also discussed.

0- 0- 9

Credit(s): 1

DL

POE103 Maritime Political Geography

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course provides an introduction to the field of maritime political geography and deals with maritime affairs from the perspective of the international law of the sea and the practice of states. It introduces students to the oceanic geographical environment, looks at the historical relationship between humanity and the sea, examines the important issues of the property of marine resources and maritime spaces, and presents the United Nations Convention on the Law of the Sea. Further topics that are explored include the contemporary territorialisation of maritime spaces, resources and environment management, the specific issues of geographically disadvantaged and land-locked states, the concept of "maritime region," and maritime conflicts. An introduction to naval applications in a Canadian maritime context permits studies of specific issues in relation to national security.

0- 0- 9

Credit(s): 1

DL

POE106 Canadian Civics and Society

An introduction to the main trends of political thought, the elements of political analysis, and the concepts used in the study of political science as found in Canada.

Core Course for students of the First Year taking Arts.

3- 0- 6

Credit(s): 2

2nd Year

ECE206A Macroeconomic Theory and Policy I

This intermediate macro course covers the fundamental theory underlying national income determination. The role of Monetary and Fiscal Policies in closed and open economies is studied with particular reference to the contemporary Canadian economy. Purchasing Power parity and Interest Rate parity are also discussed.

Prerequisite: ECE/F102(A+B) or ECE/F103 or ECE/F104

Note: For students of the Second and Third Year taking Arts and other students with the permission of the Department.

3- 0- 6

Credit(s): 1

ECE224A**Microeconomics I**

This course is intended to provide theoretical and practical knowledge of markets. It concentrates on price determination, business decision-making and consumer behaviour within different forms of market organization. A major goal of the course is to demonstrate the practical advantages of applying microeconomic concepts and models to the recognition and analysis of social and business issues.

Prerequisite: ECE/F102(A+B) or ECE/F103 or ECE/F104

3- 0- 6

Credit(s): 1

ECE270A**Statistical Analysis for Social Scientists I**

This is an introductory course in statistics designed for students in Social Science. Topics include visual and statistical descriptions of data, sampling and sampling distributions, and the estimation of sample statistics. Problem solving is emphasized using hypothesis testing and confidence intervals on means, proportions and differences. Variance tests are also analysed.

Note: For students of the Second, Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE205**Canadian Civics and Society**

An introduction to the main trends of political thought, the elements of political analysis, and the concepts used in the study of political science as found in Canada.

Note: Core course for students in Engineering and Science.

3- 0- 3

Credit(s): 1

POE206 The Canadian Forces and Modern Society: Civics, Politics and International Relations

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course addresses Canadian government and politics within a global context, discusses the impact of political culture and socialization on understandings of the nature of politics, examines the changing role of the nation-state in the context of regional integration and globalization, assesses the nature and accountability of government processes and institutions, and considers the effectiveness of institutions linking state and society. The course also examines the influence of changes within Canadian society

and within the international system on the organization and operation of the Canadian military.

0- 0- 9

Credit(s): 1

DL + web

POE210**Introduction to Peacekeeping**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is designed to introduce students to the wide range of activities referred to as peacekeeping. The history of peacekeeping is reviewed through a series of case studies to better understand the evolution of contemporary peace support operations. This course provides an analysis of the consequences of peacekeeping and the emerging trends in the field, including gender and peacekeeping, HIV/AIDS and peacekeeping, and the impact of non-state actors on peacekeeping.

0- 0- 9

Credit(s): 1

DL + web

GOE202A/B**Introduction to Political Geography**

Appreciating the geographical arena within which political life unfolds, and the geopolitical influences, resources, and possibilities which that environment presents for political action, are key elements in understanding the political behaviour of actors, ranging in scale from the individual to the group on to the nation state and international organizations. This course presents an overview of the field of political geography and explores the centripetal and centrifugal dimensions of personal space, territoriality, regionalism, population growth and resource distribution, environmental degradation, boundary disputes, the rise and fall of nation states and civilizational conflicts.

Note: Mandatory course for Second Year students in Political Science, open to students in Arts.

3- 0- 6

Credit(s): 1

3rd Year

ECE300A/B**Money, Financial Institutions and Markets**

This course examines money supply determinants, Canadian financial markets (the money market, the stock market, bond markets, mortgage markets, options markets, futures markets, the foreign exchange market) and the operations of financial institutions that participate in these markets.

Note: For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE308B**Macroeconomic Theory and Policy II**

This course examines major themes in macroeconomics including deficits and debt, inflation, expectations and growth theory. Students are exposed to the Canadian experience in debt accumulation and inflation policies. Neo-classical growth theory is used to differentiate between nominal, real and per capita growth and those factors which give rise to continuous growth or simply periodic spurts in growth. Technological change is linked both to growth and to globalization.

3- 0- 6

Credit(s): 1

ECE312A/B**The Development of Economic Ideas**

This course is intended to broaden the view of students who have studied intermediate theory. The ideas of Smith and Ricardo and the Marginalist School will start the course. Potential topics include Marxian economics, institutional economics and social planning.

Note: For students of the Second, Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE316A/B**Canadian Economic History**

For students of the Second, Third or Fourth Year taking Arts. The development of the Canadian economy with special reference to capital, population, and technology, in the light of modern growth theories.

3- 0- 6

Credit(s): 1

ECE318A/B**International Economic Problems**

The course will examine the following topics: world trade patterns and commodity markets, theory and structure of tariffs, customs unions, balance of payments, foreign investment, international monetary system, and international aid.

3- 0- 6

Credit(s): 1

ECE320A/B**Industrial Organization**

Industrial Organization examines the structure, conduct and performance of industry. Topics to be covered will include: industry concentration, economics of scale, patents, vertical integration and barriers to entry, the goals of the firm, the growth of the firm, multi-nationals, advertising, price formation and government influences on industrial organization.

Note: For students of the Third and Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE326B**Microeconomics II**

This course extends the scope and methods of market analysis introduced in ECE324A. The syllabus includes an examination of markets characterized by monopolistic competition, oligopoly, and price discrimination. Special attention is paid to questions of market efficiency, including public regulation of markets and the economic role of government. Additional topics include introductions to the economics of finance and to the economics of information.

3- 0- 6

Credit(s): 1

ECE372B**Statistical Analysis for Social Scientists II**

This course follows Statistical Analysis for Social Scientists I. The course discusses survey planning, sample design, and questionnaire design. Statistical analysis focuses on simple and multiple regression methods. Instruction will also be given in the use of computer resources both for the collection of data as well as data analysis. Students will be given the opportunity to conduct a small project which will include model specification, data collection, examination, display, and model analysis.

Note: For students of the Second, Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE312A**Classical Political Philosophy**

For students of the Second, Third or Fourth Year taking Arts. This course is a critical examination of the major political theorists ascribed to Classical Political Philosophy. The works studied include Thucydides' Peloponnesian War, Xenophon's Memorabilia, Plato's Republic, Aristotle's Politics,

Machiavelli's The Prince and Discorsi.

3- 0- 6

Credit(s): 1

POE314B**Modern Political Philosophy**

A sequel to POE312A. It is strongly recommended that it be taken before POE314B, but it is not required. This course is a critical examination of the main works of the major political theorists ascribed to Modern Political Philosophy. The works studied include Hobbes' Leviathan, Locke's Second Treatise on Civil Government, Hume's Treatise of Human Nature, Rousseau's On the Origin and Foundations of Inequality among Men and On the Social Contract, Kant's Grounding of the Metaphysics of Morals and Towards Perpetual Peace, Marx and Engels' Communist Manifesto, Mill's On Liberty, and Nietzsche's On the Genealogy of Morals.

3- 0- 6

Credit(s): 1

POE316A**Introduction to International Relations**

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is designed to introduce students to the field of international relations. It will permit students to understand the basic concepts in the field needed to analyse developments in international politics. At the same time, the main analytical approaches in the discipline will be offered in such a way that students will be able to evaluate various approaches and to assess their utility in explaining events, processes and institutions in international politics. A core consideration in the course will be the development of an awareness of how states define and meet security requirements and issues in international relations.

Note 1: For students of the Second, Third or Fourth Year taking Arts.

Note 2: Core course for all students.

3- 0- 6

Credit(s): 1

POE317B**Introduction to Contemporary Strategic Studies**

This course is designed to introduce students to contemporary strategic studies. The focus will be on contemporary strategic issues. Developments in the international system since the end of World War II and the end of the Cold War will provide the context for the consideration of contemporary and future developments in the international system.

Note: Mandatory for students in Third and Fourth Year in Arts.

3- 0- 6

Credit(s): 1

POE319	Terrorism: Theories and Strategies
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Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course will analyze terrorism from a theoretical and strategic point of view. The concepts and the evolution of terrorism over time will be among the topics discussed. It will focus on the relationship between terrorism and war in all its forms as well as anti-terrorist methods, policies and war. The aim of the course is to allow students to synthesize terrorism using their assimilation of political and strategic facts linked to this phenomenon.

Prerequisite: POE316 or equivalent

0- 0- 9

Credit(s): 1

DL + web

POE320A	Comparative Politics I (Theory and Method)
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The course will commence with an overview of the many different and competing theories of comparative politics, and will evaluate the strengths and weaknesses of each framework. In so doing, discussion will take place on the key issues in comparative politics. The course will also explore the increasing variety of measures employed in comparisons of the major regions and countries of the world. During the latter portion of the course, each student will select one country as a brief case study.

Note: For students of the Second, Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE322B	Comparative Politics II (Country Case Studies)
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Building upon the first semester course POE320A which reviewed the many theoretical frameworks available for analysis in comparative politics, the winter semester course utilizes a country by country case study approach. Amongst the countries to be covered in depth are the United States, the United Kingdom, Russia (the former Soviet Union), Canada and Mexico.

Prerequisite: POE320A

Note: For students of the Second, Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE328A	The Canadian Constitution, Federalism and Regionalism
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The course will commence with an overview of the demographic (particularly regional) makeup of Canada and will then proceed to offer a brief review of the historical roots of Confederation. The main component features of the contemporary Canadian constitution will be explored, along with the current dynamics of Canadian federalism. The course will close with an analysis of the current strains and stresses (e.g. from Quebec and the West) confronting the federation and the future of the Canadian federation.

Note: For students of the Second, Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE324A/B	International Organizations
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This course will cover the development of international organizations during the 20th century. The thinking associated with international organizations as a phenomenon of state-to-state cooperation will be examined. Primary emphasis will be given to the United Nations, along with other international organizations such as the international financial institutions.

Students who complete the course will finish with an understanding of the theory and role of international organizations in international relations, a strong background in how the United Nations and associated international financial institutions have evolved and operated since World War II, as well as an awareness of the major issues facing international organizations generally in the current political environment.

Prerequisites: POE 316A, POE 317B

3- 0- 6

Credit(s): 1

POE330B	Canadian Political Parties, Elections and Public Opinion
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This course will explore the historical, ideological and organizational developments of Canadian political parties. Amongst the themes to be explored are the complexities of the evolving party system and the relative impact of key demographic and attitudinal factors affecting the operation of parties. The course will offer case studies of the most important elections in the contemporary era and will conclude with an analysis of the most recent federal election campaign. Throughout the course, note will be made of the shifting landscape in Canadian and Quebec public opinion and how it impacts on elections and parties.

Note: For students of the Second, Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE332A/B**Public Administration in Canada**

A study of organization theory and its application to the practice of public administration in the Canadian bureaucracy and government.

Note: For students of the Third or Fourth year taking Arts.

3- 0- 6

Credit(s): 1

POE334B**Canadian Public Policy-Making, Theory and Practice**

A study of many theories of public policy and their application in the federal government of Canada. The consequences of the choice of these theories on the public policies is also analyzed.

Note: For students of the Third or Fourth year taking Arts.

3- 0- 6

Credit(s): 1

GOE302A/B**Canadian Geography**

An introduction to the historical, cultural and political geography of Canada with a special emphasis on heartland-hinterland relations, regionalism, ethnic and immigration history, and the emerging multicultural nature of Canadian society.

Note: For students in Second, Third, and Fourth Year Arts.

3- 0- 6

Credit(s): 1

GOE305A**World Regional Geography: Europe and/or the Americas**

An introduction to the geography of Europe and/or Americas, the study of the "geographic personalities" of Europe and America's major countries, and of emerging geopolitical interactions both within these regions and with other major world regions.

Note: For students in Second, Third, and Fourth Year Arts.

3- 0- 6

Credit(s): 1

GOE307B World Regional Geography: Europe and/or the Africa

An introduction to the geography of Asia and/or Africa involving an examination of the "geographic personalities" of Asia and Africa's nation-states and of emerging geopolitical interactions both within these regions and with other major world regions.

Note: For students in Second, Third, and Fourth Year Arts.

3- 0- 6

Credit(s): 1

4th Year

ECE410A Public Finance I: The Role of Government in the Economy

This course examines the role of government in the allocation of resources in a mixed economy. Topics studied include: the rationalization of government intervention in market economies due to Market Failure, the theory of Public Goods, Externalities, Public Choice, Fiscal Federalism, and intergovernmental transfers, the pricing and investment decisions of public enterprises, the principles of benefit-cost analysis, the size and growth of the public sector and of the public debt. Always, an attempt is made to relate the discussion to the Canadian context.

For students of the Third and Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE411A/B Public Finance

The course examines the role of the government in the allocation of resources in a mixed economy. Topics studied include the following: Government intervention to correct market failures; theory of public goods, externalities and second-best; public choice; tax base; fiscal federalism and intergovernmental transfers; cost-benefit analysis; efficiency and equity of taxation; incentive effects of taxation; Canadian taxes: income, consumption, corporate, wealth and property, lump-sum taxes.

Prerequisite: ECE224A

3- 0- 6

Credit(s): 1

ECE412B Public Finance II: The Canadian Fiscal System

This course examines the theory of taxation and the features of the Canadian tax system. Topics

studied include: the tax base, the efficiency aspects of taxation, including optimal taxation, the principles of equity in taxation, the incentive effects of taxation, and the incidence of taxes. The practice of taxation in Canada include a review of personal income taxes, consumption taxes, corporate taxes, and taxes on wealth and property. Time permitting, narrower selected topics in taxation will be examined.

For students of the Third and Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE416A**International Economics I: International Trade**

The foundations of international trade theory and of commercial policy are examined. Topics studied include: the classical theory of international trade, the Heckscher-Ohlin model and tests and extensions of the model, alternative theories of comparative advantage, the theory and practice of tariffs and non-tariff barriers to trade, the theory and practice of economic integration, and the effect of trade on economic growth and vice versa. Attention will be paid to Canada's role and position in the world trading system.

For students of the Third and Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE417A/B**International Economics**

The first part of this course emphasises International Trade. Topics studied include the classical theory of international trade, the theory and practice of tariffs and non-tariff barriers to trade, the theory and practice of economic integration, and the effect of trade on economic growth and vice versa. The second part of this course deals with International Finance. Topics studied include the balance of payments, foreign exchange markets, macroeconomic policy in an open economy, and the international monetary system.

Prerequisite: ECE206A

3- 0- 6

Credit(s): 1

ECE418B**International Economics II: The International Financial System**

The theory and practice of international finance are examined. Topics studied include: the Balance of Payments, the theory of exchange rate determination and exchange rate systems, the role of arbitrage, balance-of-payments adjustment under alternative exchange rate systems, macroeconomic policy in an open economy, and the international monetary system.

For students of the Third and Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE424A/B**Economics of Defence**

A consideration of the economics of defence resources`management, particularly in the Canadian context. Emphasis is placed on a systems approach to defence management and on quantitative analysis.

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE428A/B**Economics of National Security**

This course is concerned with the application of economic analysis to national security policy issues and to questions of resource allocation towards national security and within government agencies for national security. Problems of national security resource allocation are addressed using strategic analysis. The course reviews the fundamental concepts of economic analysis and then proceeds to apply them to demand side issues such as domestic security and democracy, regional and global security, and to supply side issues such as intelligence, enforcement, and legislation. Specific topics include street, food and health security, immigration, information and cyberspace, peacekeeping, intelligence, deterrence and preemption, domestic and international legislation.

Prerequisite(s): ECE/ECF206A, ECE/ECF224A

3- 0- 6

Credit(s): 1

ECE442A**Economics of the Environment**

Operational decisions, whether by the private sector or the public sector, are increasingly becoming dependent upon the satisfaction of a number of environmental concerns. This course is an introduction to the major elements of environmental analysis and policy instruments used by the public sector. Topics include the notions of dynamic efficiency and sustainability, property rights and externalities, environmental legislation, measures of costs and benefits, and pollution controls.

Prerequisite: ECE102

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE446B**Cost-Benefit Analysis of Environmental Issues**

Two central issues in any cost-benefit problem are the appropriate measures of costs and benefits to use, and the identification of all costs and benefits. This course discusses a number of theoretical issues in cost benefit analysis including risk and the appropriate discount rate, in particular as they relate to environmental studies. The specificity of each cost benefit study as well as the general principles of analysis are reinforced by studying numerous examples of environmental cost benefit analysis. Cost effectiveness analysis is also considered and its use in the examination of command and control policies are studied.

Prerequisite: ECE102

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE454A/B**Topics in Microeconomic Analysis**

This course covers a limited number of selected problems from the theory of the firm (profit - cost duality, different market structures, applied functional forms) the theory of the consumer (utility - expenditure duality, uncertainty, intertemporal choice) and the theory of Games (cooperative, noncooperative). Specific topics may change to reflect problems of current interest to students and instructor but the analysis will focus on advanced analytical methods.

Prerequisite(s): ECE/F206A, ECE/F308B; ECE/F224A, ECE/F326B.

For students of the Third and Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE456A/B**Topics in Macroeconomic Analysis**

This course reconsiders the fundamental models of macroeconomic with is an introduction to dynamics. Possible models are the basic Keynesian and IS-LM models with simple lag structures, a simple rational expectations open economy model, a model of inflation and unemployment, and models that introduce the basic ideas of bifurcation and chaos. Dynamic specifications are analysed using spreadsheet methods.

Prerequisite(s): ECE/ECF206A, ECE/ECF308B, ECE/ECF224A, ECE/ECF326B

For students of the Third and Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

ECE490**Directed Readings in Economics**

For students of the Fourth Year taking Arts, with the permission of the head of the Department.

1- 0- 9

Credit(s): 2

ECE492B**Economics Seminar**

This seminar course requires each student to undertake research paper on an approved subject. Students will prepare and present a project proposal, will present their final papers, and will comment and critique work presented by their peers.

Prerequisite(s): ECE/ECF206A, ECE/ECF308B, ECE/ECF224A, ECE/ECF326B

For students of the Fourth Year taking Arts

3- 0- 6

Credit(s): 1

POE412A/B**Contemporary American Foreign and Defence Policy**

A study of major policy trends in United States foreign and defence policy from the Nixon administration to the present. Beginning with a brief review of the Cold War years, the course will consider such topics as: the impact of the Vietnam War, détente, trends in nuclear and conventional weapons and strategy in the 1970s and 80s, arms control and United States Foreign Policy in the post Cold war era. Also covered will be the role of various branches of the U.S. government in the conduct of foreign and defence policy.

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE413A**Nuclear Weapons & International Relations - In English only**

Since 1945, nuclear weapons have had a profound impact upon international relations. This course deals with the technology, strategy and politics of nuclear weapons. It examines how the superpowers and other nuclear weapons states approached their role in national security during the Cold War and how this has changed in the post-Cold War era. It looks at the major nuclear powers as well as current issues regarding the potential spread of nuclear weapons capabilities to more countries. To what extent have previous concepts of deterrence given way to notions of preventative defence and what will this mean for contemporary global security environment? The course also provides students with techniques for the evaluation of expected nuclear weapon effects and the ways in which these techniques may be used to determine the relative strength of nuclear states in the international system

3- 0- 6

Credit(s): 1

POE416A/B Contemporary Canadian External Relations and Defence Policy

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

A study of major trends in Canadian external relations and defence policy from the Trudeau government to the present. Beginning with a review of the Cold War years, the course will consider such topics as: the Trudeau defence and foreign policy reviews, relations with the United States, including the Free Trade Agreement, the impact of international political and strategic trends on Canadian defence policy, and Canada's relations with international organizations and peacekeeping in the post Cold war era. Also covered will be the process, politics and organization of the Departments of Foreign Affairs and International Trade, and National Defence.

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE418A Major Political Ideologies

This course will focus upon the major political ideologies and belief systems. The class will discuss in-depth the major classic ideologies of the nineteenth and twentieth centuries, commencing with the oldest two, conservatism and liberalism, and then proceeding to include socialism, communism, nationalism, fascism and anarchism. Emphasis throughout the course will be on reading materials from spokespersons of each doctrine. Amongst the authors to be discussed are Burke, Locke, Mill, Marx, Lenin, Mao Tse-tung, Hitler, Mussolini, Tolstoy and Gandhi. The political dialogue amongst the various ideologues is a basis for understanding the different political systems of the world and conflict in the modern era. This course is an ideal background to taking POE420B.

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE420B Contemporary Political Ideologies

Building upon the fall semester course on major classical ideologies (POE418A), this course will focus on contemporary doctrines and ideologies advocated during the second half of the twentieth century. These will involve recent variants of the seven classic ideologies and will include the New Left, neo-conservatism, neo-liberalism, neo fascism, contemporary nationalism, feminism, environmentalism and the future of ideology. Emphasis throughout the course will be on reading materials from spokespersons of each doctrine. The political debate and dialogue amongst the various ideologues are a basis for understanding the different political systems of the world and conflict in the modern era.

Prerequisite: POE418A

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE423A**Middle-Eastern Issues**

The course will study major trends in Middle Eastern political history of its people and Empires; ethnic groups; religions and ideologies; religious and secular nationalism, colonialism, imperialism and national liberation movements; unfinished creation of modern States; political and economic development; water, oil and natural resources; civil society, social forces and agents of change; revolution, coup, conflicts and transfer of arms.

For students of the Third and Fourth year taking Arts.

3- 0- 6

Credit(s): 1

POE424A**Theories of Modernization and Political Development**

The course will provide an introduction to the major theories of social change, modernization and political development. Most of the world's population is affected by the dramatic social, economic, political and cultural changes occurring in the developing countries. Amongst the political concepts studied are the nature of traditional society, the processes of urbanization and democratization, elements of political instability ranging from coup d'état to revolution. An assessment will also be offered of the different measures of development. Throughout the course, examples will be drawn from across the third world. It is expected that this course will be followed by POE424B on selected regional and country case studies from the third world.

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POE426B**Selected Case Studies of Third World Countries**

The course will draw upon the first semester course POE424A which provided an introduction to theories of modernization and political development. The winter term course will focus on regional and country case studies from the third world. It is expected that the countries studied in depth will vary to some degree from one year to the next. Amongst the countries usually to be studied in depth are: China, India, Indonesia, Iran, Turkey, Egypt, Nigeria, South Africa, Argentina, Brazil, Mexico and Cuba.

Prerequisite: POE424A

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

POF428A/B**Théorie politique contemporaine**

Available in "French Only"

Designed as the sequel to POF312A and POF314B -Philosophie politique classique et moderne (Classical and Modern Political Philosophy) - , this course offers an introduction to the main issues currently in the discussion in the field of political theory. To this end, an approach that blends the introduction to some of the most influential authors (M. Weber, C. Schmitt, R. Aron, F. A. von Hayek, H. Arendt, L. Strauss, C. Lefort, J. Habermas, J. Rawls, C. Taylor) with a discussion of the main currents in 20th Century political theory (liberalism vs. communitarianism, positivism vs. normativism etc.) will be adopted.

Note: For students in Third and Fourth Year Arts.

3- 0- 6

Credit(s): 1

POF430A/B**Théorie politique avancée**

Available in "French Only"

Designed as a sequel to POF428A. Though it is not required, it is strongly recommended that students take this course before taking POF430B. In this course a thematic approach is taken. The major contributions to the problems and issues which are currently uppermost in the discussion in political theory are reviewed, for instance: globalization, nationalism, multiculturalism, democracy, legality and legitimacy, identity, citizenship, feminism, the social problem etc.

For students in Third and Fourth Year Arts.

3- 0- 6

Credit(s): 1

POE450B**Space Policy**

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

Space policy, strategy, doctrine and planning, space law, space agreements and conventions, use of space for civilian surveillance of space, surveillance from space, peaceful use of space, civilian and military space agencies, international cooperation in space operations, assured access to space, DND space requirements, operations, space education and training. Canadian aerospace industry, Canada's

role and future in space.

For students of the Fourth Year taking Arts or Science.

3- 0- 6

Credit(s): 1

POE458A/B**Post Cold War Terrorism**

Post Cold War Terrorism is a course designed to acquaint students with the phenomenon of terrorism and to provide a broad understanding of why terrorism exists in the contemporary international system. Students will consider among other topics, the philosophy of terrorism, the political context of terrorism and the technology of terrorism.

3- 0- 6

Credit(s): 1

POE460A**Analysis of Contemporary International Conflicts**

In the broadest context, this course considers the role of strategy and warfare in contemporary national and international society. Readings and Seminars are designed to offer students a wide range of perspectives on strategy and conflict in the post-modern world. Students will key on contemporary strategic issues relating to military and foreign affairs.

Prerequisite: POE316

3- 0- 6

Credit(s): 1

POE462B**Current Strategic Issues**

In the broadest context, this course considers the role and significance of strategy and warfare with respect to current strategic issues . Readings and Seminars are designed to offer students a wide range of perspectives on strategy and conflict in the post-modern world and to permit students to openly express their views. Students will key on contemporary strategic issues relating to military and foreign affairs.

Prerequisite: POE/F316

For Third and Fourth Year students taking Arts.

3- 0- 6

Credit(s): 1

POE488A/B**The Law of Armed Conflict**

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course aims at giving the students a solid knowledge of the rule of law in regards to the use of force in international and non-international armed conflicts. We will examine the correct interpretation of these rules under international law and explain their applicability in operational situations. We will examine the rules pertaining to the human treatment of persons under a foreign power's authority, the legal obligations pertaining to personal property and the rules regulating the use of weapons. More specifically, we will explore the notion of combatants, prisoners of war, the treatment of civilians, and the obligation of limiting damage and unnecessary suffering, as well as special cases such as children-soldier and mercenaries.

Note 1: 1 senior military credit.

Note 2: For students of the Fourth Year taking Arts or Science.

3- 0- 6

Credit(s): 1

POE490**Directed Readings in Politics**

For students of the Fourth Year taking Arts, with permission of the head of the Department.

1- 0- 9

Credit(s): 2

GOE401**World Regional Geography**

A systematic introduction to the discipline of geography followed by a detailed treatment of the political and regional geography of selected states and regions.

For students of the Second, Third or Fourth Year taking Engineering or Science.

1.5- 0- 1.5

Credit(s): 1

GOE404B**Issues in Contemporary Geopolitics**

A lecture course intended to allow students of the Third and Fourth Year taking Politics, and with permission of the instructor, for other students of the Third or Fourth Year taking Arts, the opportunity to study selected world problems from a geographical perspective. This course is also open to selected candidates with permission from the Dean of Arts.

3- 0- 6

Credit(s): 1

GOE418A/B**Approaches to Cultural and Historical Geography**

An examination of the cultural and historical dimensions of geographical inquiry with special emphasis on the changing relationships between human societies and their environments, as well as their relationships with each other. Themes to be addressed include the methods and theories of historical and cultural geography, the study of cultural landscapes and ecological relationships within modern and traditional societies, the impact of colonialism and modernization upon populations and resources, and geographies of cultural globalization. Special attention will be given to analysis of the historical and cultural geography of Canadian society in the global context.

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

GOF420A/B**Fondements géopolitiques du droit international**

Available in "French Only".

Genesis of International Public Law. International Organizations. Conditions for the recognition of the existence of individual States. Legal means of territorial expansion. Cases of reduced sovereignty. Geographical definition of the territories under national jurisdictions: horizontal and vertical extensions. Borders and jointly occupied territories. Rules governing territories under international jurisdiction: canals, seaways, rivers, high seas, sea-bed resources, polar regions, outer space. Peaceful methods of resolving international conflicts.

For students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

GOF422A/B**Géographie politique du Canada**

Available in "French Only".

Study of the natural, historical, cultural and economic factors which determine Canada's present political geography. Special attention will be directed to border zones and to the question of territorial integrity.

Prerequisite: GOF304A or GOF306B

For Third and Fourth Year students taking Arts.

3- 0- 6

Credit(s): 1

GOE470 Problems in Political Geography: Focus on Europe and Former Soviet Union

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

0- 0- 9

Credit(s): 1

DL

GOE472A/B Understanding Post-Soviet Europe and Asia

An appreciation of the political, historical, demographic and cultural geography of the former USSR, with an emphasis on the disintegrative potential of the "nationalities question" within the Soviet Empire, along with a consideration of the environmental and economic consequences of Soviet models of development throughout Eurasia. This course will conclude by introducing the "geographical personalities" of the States that re-emerged in post-Soviet Europe and Asia after 1991, exploring the resulting debate in Europe and particularly within NATO about the future of this alliance, its expansion eastwards, Russia's geopolitical concept of a "near abroad," and, ultimately, the continuing debates. East and West, over the very nature of what constitutes Europe.

3- 0- 6

Credit(s): 1

GOE490 Directed Readings in Geography

For students of the Fourth Year taking Arts, with the permission of the head of the Department.

1- 0- 9

Credit(s): 2

Mathematics & Computer Science

1st Year

MAE101**Introductory Calculus**

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

Introduction to real numbers. Real sequences. Functions: algebraic, exponential and trigonometric functions and their inverses. Limits, continuity and derivatives. Rules for differentiation. Main theorems of the differential calculus. L'Hôpital's rule. Applications of derivatives. Antidifferentiation: all basic methods. Definition of the integral, Riemann sums and fundamental theorem of calculus. Improper integrals. Applications of integration. Plane polar and 3-dimensional coordinates. Computer laboratory using MAPLE symbolic computation software to illustrate concepts and solve problems in calculus.

For First Year Students taking Science or Engineering

3- 1- 4

Credit(s): 2

MAE102**Introduction to Probability and Statistics**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course provides a non-calculus treatment of topics in Probability and Statistics. Lessons include a brief review of set operations, definitions and examples of sample space and probability of events, random variables, various discrete and continuous distributions, mean, variance and general expectations, sampling, tests of hypothesis for mean and variance, and power of tests.

0- 0- 9

Credit(s): 1

DL

MAE103A**Precalculus Mathematics**

Also offered through the Division of Continuing Studies as MAE103. Please refer to the [Division of Continuing Studies](#) for more information.

This course includes an introduction to sets, set notation, the properties of real numbers and the real number system. It also covers various topics in algebra including factoring algebraic expressions and arithmetic operations involving polynomial, rational and exponential expressions. Principal roots are covered, as is the connection between exponential and radical notation. The properties of inequalities and absolute values are introduced, and techniques for solving linear, non-linear and absolute value

equalities and inequalities are presented. The material on functions includes the combination and composition of functions and the determination of the domain of combined and composed functions. Inverse functions are examined, and the properties of logarithmic and exponential functions are studied along with some applications to "real-world" problems.

For students in First Year Arts who lack credit for a final year High School mathematics course.

3- 1- 4

Credit(s): 1

MAE106A**Discrete Mathematics with Probability**

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

Elementary logic. Introduction to sets and operations on sets. Combinations and permutations. Discrete probability.

For First Year students taking Arts

3- 0- 6

Credit(s): 1

MAE108B**Elements of Differential Calculus**

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

Review of basic algebra including powers and logarithms. The real number system, open and closed intervals, solution of inequalities. Functions and their properties. Definition of the limit and continuity of a function at a point. Limits at infinity. The intermediate value theorem. Graphs of continuous and discontinuous functions. Exponential and logarithmic functions, their graphs, properties and applications. Definition of the derivative as a limit. The mean value theorem. Derivatives of sums, products and quotients of functions. Composite functions and the chain rule. Derivatives of second and higher order. Application of differential calculus to graph sketching, optimization problems, approximation of functions and marginal analysis.

Prerequisite: MAE103A or equivalent

For First Years taking Arts

3- 1- 4

Credit(s): 1

MAE119B**Linear Algebra for Engineers**

Vectors in 2 and 3 dimensions. Lines and planes in three-space. Introduction to complex numbers. Systems of linear equations. Matrix algebra. Determinants. Finite-dimensional real vector spaces, subspaces, bases and dimension. Linear transformations. Dot products, orthogonality. Eigenvalues, eigenvectors, diagonalisation of matrices.

For First Year Students in Engineering

3- 1- 4

Credit(s): 1

MAE129B**Introduction to Algebra**

Vectors in 2, 3 and higher dimensions; geometric applications. Linear systems of equations. Matrices: matrix algebra, inverses and determinants. Solution of matrix equations. Integers: GCD, LCM, division algorithm, integers modulo n , RSA encryption. Complex numbers, arithmetic, powers and roots. Fundamental theorem of algebra and solution of polynomial equations.

For First Year Students taking Science.

3- 1- 4

Credit(s): 1

MAE131**Introductory Differential Calculus**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

Introduction to the real numbers. Functions : algebraic, exponential and trigonometric and their inverses. Limits, continuity and derivative. Rules for differentiation. Main theorems of the differential calculus. L'Hospital rule. Applications of derivatives.

0- 0- 9

Credit(s): 1

MAE133**Introductory Integral Calculus**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

Antidifferentiation : techniques of integration. Riemann sums, definition of the integral and fundamental theorem of Calculus. Improper integrals. Applications of integration. Polar coordinates. First and second order linear differential equations.

Prerequisite: MAE131 or equivalent

0- 0- 9

Credit(s): 1

CSE101B Introduction to Algorithms and Computing

Also offered through the Division of Continuing Studies as CSE101. Please refer to the [Division of Continuing Studies](#) for more information.

The subject of this course is the design, analysis and implementation of algorithms. It examines the relationship between problem solving and algorithms, the design of algorithms using pseudocode; sequence, selection and iteration; and abstraction (functions), and the correctness and efficiency of algorithms. Algorithms for tasks such as searching, sorting and pattern matching will be introduced and analyzed. Algorithms will be implemented in a high-level programming language as programs using appropriate data types, statements and methods. The use of compilers, interpreters and virtual machines in executing programs will be studied. An introduction to object-oriented programming, classes and objects will be given.

For First Year students taking Engineering and Science.

3- 1- 4

Credit(s): 1

2nd Year

MAE208A Elements of Integral Calculus and Linear Algebra

Also offered through the Division of Continuing Studies as MAE208. Please refer to the [Division of Continuing Studies](#) for more information.

Antiderivatives and indefinite integration. Rules of integration (substitution and integration by parts). Riemann sums, definite integrals and the Fundamental Theorem of Calculus. Numerical techniques for approximating definite integrals. Applications of definite integrals to problems in business and economics, and to the evaluation of probabilities and expected values. Improper integrals and their evaluation. Linear systems of equations and their solutions. Matrices and matrix operations. Matrix representation of linear systems and Gaussian elimination.

Prerequisite: MAE108B or equivalent

Note: For Second Year students taking Arts

3- 1- 4

Credit(s): 1

MAE209A/B Probability and Statistics

Foundations of Probability and Statistics. Brief review of set operations. Definitions and examples of sample space and probability space. Random variables, various discrete and continuous distributions.

Mean, variance and general expectations. Sampling, tests of hypothesis for mean and variance, power of tests.

Prerequisite: MAE222A or MAE226A

3- 0- 4

Credit(s): 1

MAE222A**Intermediate Calculus: Multivariable Functions**

Vector-valued functions; curves. Functions of several variables; partial derivatives, Taylor's formula, extreme value problems. Vector fields, gradient, divergence, curl. Multiple integrals. Line and surface integrals. Green's, divergence and Stokes' theorems.

Prerequisite: MAE101

For Second Year students in Engineering and Science. Required for Honours Mathematics

4- 1- 5

Credit(s): 1

MAE223B**Intermediate Calculus: Differential Equations and Infinite Series**

Ordinary differential equations: theory, methods of solution and applications of first order and higher order linear. Limit of sequences. Infinite series: definition of convergence, tests. Series of functions: uniform convergence, power series, Taylor polynomials and remainder, Taylor series and applications.

Prerequisite: MAE101

For Second Year students in Engineering and Science. Required for Honours Mathematics

3- 1- 4

Credit(s): 1

MAE226A**Engineering Calculus: Multivariable Functions**

Vector-valued functions, curves. Functions of several variables. Partial derivatives. Extreme values. Scalar and vector fields. Gradient, divergence, curl. Line and surface integrals. Greens, divergence and Stokes' theorems.

Prerequisite: MAE101

4- 1- 5

Credit(s): 1

MAE227B Engineering Calculus: Differential Equations and Infinite Series

Ordinary differential equations: theory, methods of solution and applications of first order and higher order linear. Limit of sequences. Infinite series: definition of convergence, tests, power series, Taylor polynomials and remainder, Taylor series and applications.

Prerequisite: MAE101

3- 1- 4

Credit(s): 1

MAE229A/B Linear Algebra

Propositional logic. Introduction to vector spaces. Subspaces, bases and dimension. Linear transformations and matrix representations. Eigenvalues, eigenvectors and diagonalization of matrices. Inner products; Gram-Schmidt process.

A second version of this course will be available (in English only) for weaker students, in which there will be an additional lecture period. (Contact hours: 4 - 1 - 4)

Prerequisite: First year Science or Engineering.

Mandatory in Mathematics programmes and for the Honours BSc in Computer Science.

3- 1- 4

Credit(s): 1

MAE234A/B Introduction to Cryptography

This course will be an introduction to cryptography including its military, political and mathematical aspects. The course will survey both historical cryptography (antiquity to 1967) and modern (post 1967) cryptography. Students succeeding in this course will understand the workings of important modern techniques including public key cryptography, key exchange protocols and elliptic curve cryptography; both modern encryption and cryptoanalysis will be covered. More specifically, the following topics will be covered: Historical techniques such as: Alphabetic Ciphers, Frequency Analysis, Vigenere Ciphers, Kaisiski's Method, One Time Pads; The mathematical basis behind modern encryption and decryption: Basic group theory and basic properties of the integers; Modern encryption techniques such as: Public Key Cryptography, RSA, Diffie-Helman Key Exchange, Rabin Encryption, El Gamal, Discrete Log, Elliptic Curves. Modern decryption techniques such as: Birthday Attacks, Quadratic Sieve, Known Plaintext attacks, Man-in-the-middle attacks.

3- 0- 3

Credit(s): 1

MAE236A/B Introduction to Game Theory

Students succeeding in this course will understand the mathematical treatment of games that arise in real life situations and economical models. They will understand the contrast between zero-sum games and von Neumann's minimax theorem on one side, and non-cooperative games and Nash equilibrium on the other. They will be familiar with many examples arising from economical models. They will also understand the basic elements of social choice theory, including axioms of social choice, May's theorem on simple majority voting and Arrow's impossibility theorem.

3- 0- 3

Credit(s): 1

CSE260A/B

Introduction to Computer Concepts

An elective course for students in Arts. This course is part of the core curriculum. This course gives an introduction to information technology and its applications. Topics include an overview of computer hardware and system software, algorithm design, programming in a high level language, use of spreadsheets and data base systems. Computer networks and the Internet.

Security considerations.

3- 0- 6

Credit(s): 1

3rd Year

MAE304A/B

Modern Algebra

Divisibility properties of integers, the Euclidean Algorithm and GCDs. Prime numbers, Mersenne and Fermat Numbers. Groups, finite groups, the integers modulo n , Wilson Theorem. Subgroups, Lagrange Theorem and Fermat First Theorem. Linear congruences and the Chinese Remainder Theorem. Galois fields.

Prerequisite: MAE229A/B

Mandatory in Mathematics programmes.

3- 1- 4

Credit(s): 1

MAE305

Differential Equations, Fourier Analysis, Boundary Value Problems and Complex Variables

Fall Term

Laplace transforms and initial value problems. Fourier series, integrals and transforms. Power series

and Frobenius methods for linear differential equations. Bessel's equation and functions.

Winter Term

Partial differential equations and solution of boundary value problems using method of separation of variables. Functions of a complex variable: analytic functions, Taylor and Laurent series, complex integration, residue theorem.

Prerequisites: MAE222A or MAE226A, MAE223B or MAE227B.

For Third Year Students taking Electrical Engineering or Science

3- 1- 4

Credit(s): 2

MAE305(1) Laplace Transforms, Fourier Analysis and Differential Equations

This course consists of the Fall Term of MAE305.

Prerequisites: MAE222A or MAE226A, MAE223B or MAE227B.

For Third Year Students taking Computer Engineering

3- 1- 4

Credit(s): 1

MAE310A/B

Statistics

Sampling distributions; estimation of population parameters - point and interval estimators; hypothesis testing for one or two groups; test for goodness of fit, contingency tables; quality control and simple linear regression; time series.

Prerequisite: MAE209A/B

3- 1- 4

Credit(s): 1

MAE315A

Differential Equations and Fourier Series

Laplace transforms and application to solution of initial-value problems. Fourier series and integrals. Solution of linear differential equations using power series and Frobenius method. Bessel equation and functions.

Prerequisites: MAE222A or MAE226A, MAE223B or MAE227B

For Third Year students taking Chemical Engineering.

3- 0- 3

Credit(s): 1

MAE327 Differential Equations, Boundary Value Problems and Complex Variables

Laplace transforms and the solution of ordinary differential equations. Fourier series and integrals. Partial differential equations and the method of separation of variables. Boundary value problems. Functions of a complex variable. Conformal mapping.

Prerequisites: MAE222A or MAE226A, MAE223B or MAE227B.

For Third Year students taking Mechanical Engineering.

2- 0.5 - 2.5

Credit(s): 1.5

MAE331B Mathematics of Signal Processing

Distributions, Dirac's delta function and convolutions. Correlation and autocorrelation. Linear time-invariant systems. Continuous and discrete signals. Impulse and step responses. Transfer function and frequency response. Applications of the Laplace transform. z-transform and solutions of finite difference equations. Applications of the Fourier Transform. Nyquist rate and Shannon's signal reconstruction formula, discrete Fourier transform, wavelet analysis.

Prerequisite: MAE305(1)

3- 0- 4

Credit(s): 1

MAE333A/B Introduction to Discrete Mathematics

Brief review of permutations and combinations. Fundamentals of logic. Properties of the integers including induction, recursion, primes and modular arithmetic. Enumeration including the pigeonhole principle, inclusion/exclusion, generating functions and recurrence relations.

Mandatory in the Computer Science programmes.

3- 1- 4

Credit(s): 1

MAE334A/B Graph Theory

Graphs and sub-graphs, trees, connectivity, Euler tours and Hamiltonian cycles, matchings, independent sets and networks. Graph theoretic algorithms for finding spanning trees, shortest paths in weighted graphs and maximal flows in networks. Selected applications will cover timetabling,

travelling salesman and tournament scheduling type problems.

Prerequisites: CSE101B, MAE229A/B, MAE333A/B (also recommended)

3- 1- 4

Credit(s): 1

MAE340A/B

Foundations of Probability

Probability; random variables and distributions; joint distributions; functions of random variables; conditional expectations; sequences of random variables; stochastic processes.

Prerequisites: MAE222A or MAE226A, MAE223B or MAE227B, MAE209A/B

3- 1- 4

Credit(s): 1

MAE352A/B

Non-Linear Optimization

Nonlinear Optimization deals with the problem of optimizing i.e. minimizing or maximizing an objective function in the presence or in the absence of equality and inequality constraints. Nonlinear Optimization has many applications in Engineering, Sciences, Economics and in several domains of military activities. In this course will be presented the main mathematical concepts, optimality conditions and numerical methods considered now in Nonlinear Optimization. Short introductions to Optimal Control Theory and Global Optimization will be also presented.

The main subjects of this course are the following. Convex Analysis. Geometrical Optimality Conditions. Optimality Conditions and Duality. Lagrangian Duality and Saddle Point Optimality Conditions. Numerical Algorithms and their convergence. Introduction to optimal Control Theory. Introduction to the Global Optimization.

Several examples and applications will be given.

Prerequisites: MAE222A or MAE226A, MAE223B or MAE227B

3- 0- 4

Credit(s): 1

MAE354A/B

Non-linear Dynamical Systems, Chaos and Fractals

Some non-linear systems exhibit unexpected behaviours that require novel methods of explanation. Such are the chaotic systems, the evolution of which is unusually sensitive to small variations in the initial conditions. Chaos in the heavens; asteroids and comets and on Earth; simple iterated functions. Fractals; objects of fractional dimensions. MAPLE will be used to illustrate the effects studied.

Key subjects are: periodicity, orbits, bifurcations, non-linear maps (Hénon), Julia set, Mandelbrot set,

pendulum motion, Lorenz butterfly and strange attractor.

Having done two years at RMC or the equivalent in Mathematics and Computer Science.

3- 0- 4

Credit(s): 1

MAE374A/B

Conflict Analysis

The ability to understand and resolve conflicts is a required skill for decision makers in every domain. The purpose of this course is to present the part of Game Theory and its techniques designed to solve real world problems. The material presented includes models and analysis methods from Stability Analysis, Hypergame Analysis, Two and n-Player Games Analysis, Equilibrium Analysis (such as Nash's equilibrium), as well as Dynamic Modelling.

This course is of great value to future analysts of both civil and military issues. It provides them with the tools to disentangle complex real economical or geopolitical issues in order to determine the cause(s) and assist in the selection of a rational solution.

The main subjects of this course are the following. Types of conflicts; Simple conflict analysis, Garrison conflict. Hypergames; Cuban Missile Crises, Normandy Invasion. Metagames; Mathematical description, Analysis, Characterization theorem. Conflict analysis methods; Two and N-Player games, Nuclear conflict. Theory and implications of conflict analysis; Foundations, Equilibriums and solution concepts, Classical Game Theory. Solution procedures for non-cooperative games; Stability, Existence with examples, Special classes of games. Dynamic modeling; Supergames, Nuclear conflict, Time transition matrices.

Prerequisites: MAE222A or MAE226A, MAE223B or MAE227B, MAE229A/B

3- 0- 4

Credit(s): 1

CSE301A/B

Scientific Computing

Sources of error in numerical computation. Stable and unstable algorithms, computational pitfalls. Topics in numerical analysis including the solution of linear and non-linear equations, numerical integration and differentiation, polynomial and spline interpolation, discrete least squares approximation, numerical solution of ordinary differential equations.

Prerequisites: MAE222A or MAE226A, MAE223B or MAE227B, MAE129A, CSE101B

3- 1- 4

Credit(s): 1

CSE 321A/B

Algorithm Analysis

Analysis of algorithms and computational complexity, complexity measures and standard complexity classes, use of recurrence relations to analyze recursive algorithms. Fundamental algorithmic strategies: brute-force, greedy, divide and conquer, recursive backtracking. Strings and pattern-matching algorithms. Graph and tree traversals, algorithms for shortest-path, transitive closure, minimum spanning tree. Implementations of graphs and trees. Introduction to computability, Turing machines, algorithmically unsolvable problems, halting problem.

Prerequisite: CSE350A

Mandatory in the Computer Science programmes.

3- 1- 4

Credit(s): 1

CSE323A/B**Formal Languages and Automata**

Introduction to the theory of automata and formal languages with application to the theory of computation. Deterministic finite automata, regular languages, pushdown automata, context free grammars, Turing machines (TM), unsolvable problems about TM and grammars, P and NP classes, NP completeness.

Prerequisite: CSE350A or permission of the department

3- 2- 4

Credit(s): 1

CSE341B**Introduction to Database Systems**

Database system concepts; Primary file organization and index structures; Data modeling using entity-relationship model and enhanced entity-relationship model; Relational model, Normalization; relational algebra and relational calculus; SQL, Embedded SQL and JDBC; query optimization, transaction processing; security and database integrity.

Prerequisite(s): CSE101B and CSE350A or permission of the department

Mandatory in the Computer Science programmes.

3- 2- 5

Credit(s): 1

CSE350A**Data Structure and Algorithms**

O notation, and analysis of simple algorithms. Fundamental data structures (stacks, queues, hash tables, trees and graphs) and their implementations. Fundamental algorithms: quicksort and other $O(n \log n)$ sorting algorithms, hashing and collision-avoidance, binary search, operations on binary trees. Introduction to graphs and finding shortest-paths.

Prerequisite: CSE101B

Note 1: Mandatory in the Computer Science programmes and for the Honours BSc in Mathematics.

Note 2: For Computer Science programmes, it should be taken in the 2nd year

3- 2- 5

Credit(s): 1

CSE362A/B**Software Development and Professional Practice**

This course starts with a description of human-computer interaction issues in software design. The course then covers a range of topics integral to the design, implementation, and testing of a medium-scale software system with the practical experience of implementing such a project as a member of a programmer team. Finally, the course includes material on the social context of computing as well as professionalism and ethical responsibilities in software development.

Prerequisite: CSE350A

Mandatory for the Honours BSc in Computer Science.

3- 2- 5

Credit(s): 1

CSE390A/B**Multiprocessing, user interfaces, graphics systems and e-commerce**

The course starts by covering aspects of conventional computer architecture such as memory systems and functional organization. Then, multiprocessing and alternative architectures beyond the classical von Neumann model are studied. The second portion of the course will teach fundamental issues in human-computer interaction, event-driven programming and effective graphical user interface (GUI) design, with practical experience building a GUI. The third part of the course is concerned with graphics software and video. The fundamental techniques involved in the design of graphic systems are studied using a graphics API and more advanced topics such as geometric modeling and graphics rendering algorithms are also included. Finally, in the course fourth and last part, e-commerce is covered.

Prerequisite: CSE350A

Mandatory for the Honours BSc in Computer Science.

3- 2- 5

Credit(s): 1

4th Year

MAE404**Advanced Mathematical Analysis**

The goal of this course is to present students with some fundamental notions and results of modern mathematical analysis, necessary for applied analysis. Its content constitutes a good background for

many courses in the Master's or PhD programme.

First term:

Real numbers; axioms of \mathbf{R} , accumulation points, Bolzano-Weierstrass theorem. Topological spaces; bases and sub-bases, open neighborhood systems, subspaces, continuity, axioms of separation, convergence, compactness and connectedness. Metric spaces; their topology, convergence and continuity, compactness, complete metric spaces, Cantor's theorem. Banach and Hilbert spaces; topology on normed vector spaces, linear operators, dual, norm and weak convergence orthogonality in Hilbert spaces, orthogonal and orthonormal sequences in Hilbert spaces, projection, linear functionals and Riesz's representation theorem.

Second term:

Lebesgue integrability; step functions, Lebesgue integrable functions, fundamental theorems, locally integrable functions, the spaces, L^1 , L^2 , L^p . Linear operators between Banach spaces; bounded linear operators, bilinear functionals, adjoint and self-adjoint operators, invertible, normal, isometric and unitary operators, positive operators and compact operators. Fixed point theorems and applications; Banach's contraction principle, Brower's theorem, Schauder's theorem, applications to iterative methods, to differential equations and to integral equations. Convex analysis; convex sets, convex functions, epigraph, convexity and differentiability. Differentiability and subdifferentiability; Fréchet differentiability, directional differentiability, subgradient.

Prerequisites: MAE229A/B, MAE305

Mandatory for the Honours BSc in Mathematics.

3- 0- 4

Credit(s): 2

MAE404(1)

Advanced Mathematical Analysis - Part 1

This course consists of the Fall Term of MAE404.

Real numbers; axioms of \mathbf{R} , accumulation points, Bolzano-Weierstrass theorem. Topological spaces; bases and sub-bases, open neighborhood systems, subspaces, continuity, axioms of separation, convergence, compactness and connectedness. Metric spaces; their topology, convergence and continuity, compactness, complete metric spaces, Cantor's theorem. Banach and Hilbert spaces; topology on normed vector spaces, linear operators, dual, norm and weak convergence orthogonality in Hilbert spaces, orthogonal and orthonormal sequences in Hilbert spaces, projection, linear functionals and Riesz's representation theorem.

Prerequisites: MAE129A, MAE305

This course consists of the Fall Term of MAE404.

3- 0- 4

Credit(s): 1

MAE408A/B**Numerical Analysis**

Solutions of partial differential equations using implicit difference methods for parabolic, elliptic and hyperbolic equations, and methods for gradient boundary conditions; introduction to finite element methods; root finding and optimisation; modern simulation techniques including Monte Carlo, pseudo-random number generation, and simplex applications; other advanced topics as appropriate.

Prerequisites: MAE222A or MAE226A, MAE223B or MAE227B, CSE301A/B

3- 0- 3

Credit(s): 1

MAE413A/B**Mathematical Physics**

Integral representation of functions. Green's functions in one and higher dimensions. Solutions of integral equations. Additional topics in mathematical physics as time permits. Software packages for symbolic and numerical computation will be used wherever possible.

Prerequisite: MAE305

3- 0- 3

Credit(s): 1

MAE451A/B**Topics in Mathematics**

The objective of this course is to allow members of the department to share their expertise with students in areas of mathematics not covered in other courses. Students will present seminars and written reports, as appropriate.

Prerequisite: Permission of the instructor

0- 3- 3

Credit(s): 1

MAE456A/B**Mathematical Modelling**

This course involves a study of the principles of mathematical modelling. Continuous models based on ordinary differential equations, systems of ordinary differential equations, partial differential equations and integral equations. Models based on optimization and variational calculus. Each model type will be illustrated by concrete examples and numerical methods appropriate to these equations will be investigated. The latter part of the course will be dedicated to a qualitative study of mathematical models. Mathematical models for military problems will be considered.

Prerequisite: MAE305

3- 0- 4

Credit(s): 1

CSE411A **Advanced Database Concepts and Applications**

Concurrency and recovery. Decision support . Object databases. Distributed databases and client-server architecture. Active databases and temporal databases. Deductive databases. Data warehousing and data mining. Study of applications such as GIS, genome database, bioinformatics, digital library and multimedia databases.

Prerequisite: CSE341B

3- 2- 5

Credit(s): 1

CSE444A/B **Advanced Programming**

Laboratory exercises designed to introduce the students to the basic concepts of multiprocessing, multithreading, interprocess communication, distributed programming, parallel computing, socket connection, client/server model, networking, UDP and TCP protocols, routing information protocols, web security, fundamentals of cryptography, firewalls.

Prerequisite: CSE350A

Note: Each student must develop a project.

0- 2- 4

Credit(s): 1

CSE451A/B **Topics in Computer Science**

The objective of this course is to allow members of the department to share their expertise with students in areas of computer science not covered in other courses. Students may be expected to work on software projects, and will present seminars and written reports as appropriate.

Prerequisite: Permission of the instructor

0- 3- 3

Credit(s): 1

CSE453A/B **Modeling and Simulation**

After the course, students will be able to solve problems using computer simulations. More specifically, students will be able to describe the procedures involved in modeling and simulation; they will know how to structure and then verify models for complex systems, how to conduct designs of experiment on models, i.e., simulation, and how to measure and evaluate these experiments (simulation

analysis). Advanced applications will be shown and students will be able to solve problems by using various skills of modeling and simulation. Finally, they will be able to apply their knowledge of modeling and simulation to solve defence related applications.

Perequisite: CSE101B

3- 2- 4

Credit(s): 1

CSE472A/B**Foundations of Artificial Intelligence**

This course gives a comprehensive introduction to the foundations of Artificial Intelligence (AI). It starts with an introduction to intelligent agents. Secondly, it reviews the methods of solving problems by searching and game playing. Then, it explores knowledge, knowledge representations and reasoning with the help of propositional and first order logics. Furthermore, AI programming languages such as Prolog/Clips/JESS and their usages in building expert systems are studied. Afterwards, knowledge and reasoning with uncertainty are discussed. It also explains some concepts of machine learning from the aspects of statistics and mathematics. In addition, computer vision, dealing with sound, and robotics are introduced. Finally, it highlights major applications of AI for military defence.

Prerequisite(s): CSE350 or CSE321

Mandatory for the Honours BSc in Computer Science.

3- 2- 3

Credit(s): 1

CSE475A/B**Genetic Algorithms and Neural Networks**

Genetic information processing. Natural mechanisms of optimization of species. Molecular computers. Algorithm of artificial genetics. Neural networks. Elements of functioning of natural networks and of learning. Artificial networks: the most important models, including the perceptron, the adaline, the associative memories, error back-propagation, Kohonen's SOM, the radial basis functions networks, and many of their practical applications.

Prerequisites: MAE222A or MAE226A, MAE223B or MAE227B

This course includes two periods of laboratory per week. Students will use commercial software and will also write their own programs.

3- 2- 3

Credit(s): 1

Physics

1st Year

PHE 104

General Physics

This course provides an introduction to the principles of physics involved in Mechanics, Optics and Electricity.

First semester

Mechanics: kinematics, displacement, velocity, acceleration, motion in one and two dimensions, Newton's laws of motion, free-body diagrams, circular motion, friction, kinetic and potential energy, work, momentum, conserved quantities, rigid bodies, rotational motion, moment of inertia gravitation.

Second Semester

Optics: geometrical optics, reflection and refraction, images from mirrors and lenses, optical instruments. Wave nature, Huygens principle, interference and diffraction, phenomena in diffraction gratings and thin films and for analyzing the resolution of optical instruments.

Electricity: Coulomb's law, electric field and electric potential, motion of a charged particle, emf source, capacitance, current and resistance in electric circuits. Direct current circuits, Ohm's law and Kirchhoff's rules.

Serway and Jewett, Physics for Scientists and Engineers, with Modern Physics, 6th edition.

For all students in the First Year of Science and Engineering.

3- 1- 6

Credit(s): 2

Experimental Physics

This course covers the basic principles of experimental investigation. In particular the following topics are considered: the nature of measurement and associated errors, experiment planning and execution, the analysis of data errors, and the writing of a scientific report.

0- 2- 0

Credit(s): Standing in this course will be included in the standing obtained in Physics 104.

PHE108

Introduction to Oceanography

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course provides a broad overview of ocean climate at a level suitable for the non-physics student.

The course begins with an introduction to plate tectonics and ocean topography, followed by an examination of how the unique properties of seawater and their controlling budgets lead to the formation of distinct water masses, drive the global surface and deep-water circulation, and control the characteristics of sea ice, and ice climatology. Discussions focus on periodic phenomena (waves and tides) and coastal waters, including a regional description of the tides and currents, water masses and, where applicable, ice climatology specific to the Pacific, Arctic, and Atlantic Coasts of Canada.

0- 0- 9

Credit(s): 1

DL

PHE110**Elements of Electro-optics**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course introduces students to the nature of light, reflection and refraction, lenses and spherical mirrors, optical instruments, Huygen's principle, interference of light and diffraction, polarization, the photoelectric effect, lasers and holography, condensed matter, band theory of solids, and semiconductor junctions and devices.

0- 0- 9

Credit(s): 1

DL

PHE131**Mechanics**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is intended for students who wish to proceed in science or engineering. The content consists of an introduction to the principles of physics through the study of mechanics. The course covers the following material: vectors, kinematics, motion in one and two dimensions, displacement, velocity, acceleration, curvilinear motion, relative velocities, Newton's laws of motion, free-body diagrams, friction, circular motion, work done by a force, kinetic energy, conservative and non-conservative forces, potential energy, work-energy theorem, conservation of energy, linear momentum and collisions in one and two dimensions, rotational motion of rigid bodies, angular velocity, angular acceleration, rotational kinetic energy, moments of inertia, torque, angular momentum, rolling motion, and the law of universal gravitation.

0- 0- 9

Credit(s): 1

DL

PHE133**Optics**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more

information.

This course is intended for students who wish to proceed in science or engineering. The content consists of an introduction to the principles of physics through the study of optics, including lessons on the nature and speed of light, reflection and refraction, spherical mirrors, lenses and optical instruments, the wave nature of light, interference and diffraction and spectroscopy (including black body radiation and Planck's hypothesis), atomic spectra empirical models, Bohr's model, prediction of hydrogen spectral lines using Bohr's model and the correspondence principle.

0- 0- 9

Credit(s): 1

DL

PHE135**Experimental Physics**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course covers the basic principles of experimental investigation. In particular the following topics are considered: the nature of measurement and associated errors, experiment planning and execution, the analysis of data errors, and the writing of a scientific report.

For all students in the First Year of Science and Engineering.

0- 15- 0.5

Credit(s):

PHE136**Optics and Electricity**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course is intended for students who wish to proceed in science or engineering. The content consists of an introduction to the principles of physics through the study of optics and electricity. The course will include the following topics: (Optics) geometrical optics, reflection and refraction, images from mirrors and lenses, optical instruments, wave nature, Huygen's principle, interference and diffraction, phenomena in diffraction grating and thin films, and analysing the resolution of optical instruments; (Electricity) Coulomb's law, electric field and electric potential, motion of a charged particle, power source, capacitance, current and resistance in electric circuits, direct current circuits, Ohm's law, and Kirchhoff's rules.

0- 0- 9

Credit(s): 1

DL

2nd Year

PHE202B**Elementary Physics**

Topics in this introductory physics course will include Newtonian mechanics including projectile motion, work and energy; acoustic, speed of sound, sound intensity; optics, lasers, mirrors, lenses, interference and diffraction.

For students taking Arts.

3- 0- 6

Credit(s): 1

PHE203**Introduction to Astronomy**

This course provides a broad overview of modern astronomy, from the Earth and the Solar System to the limits of the Universe. The course consists of four study units: 1) Fundamentals of Astronomy; 2) The Solar System; 3) The Stars; and 4) Galaxies and Cosmology. The course has both a descriptive and quantitative component. The descriptive component is based upon the video series *Universe: The Infinite Frontier*, while the quantitative component involves a series of problem-solving modules. These modules permit the student to carry out elementary calculations relevant to our interpretation of astronomical phenomena.

Only offered through the Division of Continuing Studies. Please refer to the Division of Continuing Studies for more information.

0- 0- 9

Credit(s): 1

DL

PHE205A**Mechanics**

Oscillatory motion is studied including: undamped and damped harmonic motion. Forced harmonic motion and resonance. Damped forced oscillations. Standing and progressive waves. Conditions for static equilibrium in two and three dimensions. Introduction to fluid statics and fluid dynamics.

For students taking second year science, civil or mechanical engineering.

3- 1- 4

Credit(s): 1

PHE207A**Electricity and Magnetism**

This is an introductory course in electricity and magnetism. Topics discussed include electric fields, Coulomb's Law, Gauss' Law, electric potential. Magnetic fields, magnetic dipole moments, Biot-Savard's Law and Ampère's Law. Motion of charged particles in electric and magnetic fields. Faraday's law. Maxwell's equations in integral form. Electric and magnetic flux. Alternating current circuits,

complex impedance and RLC circuits. Electromagnetic waves.

For students taking Science and Chemical Engineering.

3- 1- 4

Credit(s): 1

PHE225B**Modern Physics**

For students in science; required for student in physics or space science honours or majors. Concepts in physics developed from 1900 are discussed including: relativistic kinematics and dynamics; space and time; Doppler effect; momentum and energy. Particle aspects of electromagnetic radiation. Wave aspects of particles. Rutherford and Bohr models of the atom. Development of the Schrodinger equation. Application of the Schrodinger equation to a particle in a box and finite potential wells. Tunnelling. Models of the Single- and many electron atoms; molecules. Nuclear structure and energetics of reactions. Radioactivity: alpha and beta decay, gamma emission.

3- 1- 4

Credit(s): 1

PHE226B**Modern Physics**

This course is identical to PHE225B except students do not take Experimental Physics B.

For students in Chemistry.

3- 1- 4

Credit(s): 1

PHE227B**Electromagnetism**

This is an advanced course in electricity and magnetism. Topics discussed include electric field, electric flux density, Gauss's law, electric potential, electric polarization, dielectrics and electric boundary conditions. Magnetic field, magnetic flux density, magnetic vector potential, Biot-Savard's law, Ampere's law, magnetic dipole, magnetization and magnetic boundary conditions. Faraday's law, displacement current. Maxwell's equations in their final integral and differential forms.

For students in Science.

3- 1- 4

Credit(s): 1

PHE228B**Electromagnetism**

This course is a high level introduction to electromagnetism formulating the fundamental laws (Maxwell's Equations) in both integral and differential form, in vacuum and in material media. Major topics include: Gauss's law; Electric potential; Electric dipole; Polarization; Electric boundary conditions; Poisson's and Laplace's equations; Electrostatic boundary-value problems; Biot-Savart law; Ampère's law, Maxwell's equations for static EM fields; Magnetic vector potential; Magnetic forces, the Hall effect; Magnetization; Magnetic materials; Magnetic boundary conditions; Magnetic circuits and Magnetic energy.

Note For students taking second year Electrical Engineering or Computer Engineering.

3- 2- 5

Credit(s): 1

Experimental Physics A

The laboratory is introduced by a short course on electrical instrumentation. Thereafter the students choose from a wide variety of experiments that have been selected to train them in the principles of experimental measurement. Much of the design and analysis of the experiments is done by the students independently.

For students of the Second Year taking Engineering and Science.

0- 3- 3

Credit(s): Standing in this course will be included in the standing obtained in PHE205A and PHE207A

Experimental Physics B

Standing in this course will be included in the standing obtained in PHE225B and PHE227B.

The students choose from a wide variety of experiments that have been selected to train them in the principles of experimental measurement and to illustrate some fundamental physical concepts.

For students of the Second Year taking Science.

0- 3- 3

Credit(s):

PHE233**Elements of Physics**

The concepts of energy and its conservation are used as a vehicle to explore a number of areas in modern physics. The course is designed for students with a non-technical background. Topics include: motion and Newton's laws; work, energy, and the laws of energy conservation; mechanical waves and sound; electromagnetic waves and light; atomic structure; states of matter; and the nucleus and nuclear

energy.

Only offered through the Division of Continuing Studies. Please refer to the Division of Continuing Studies for more information.

0- 0- 9

Credit(s): 1

DL

3rd Year

PHE300A

Modern Physics

Atomic Physics: The hydrogen atom. The exclusion principle. The electronic structure of atoms and the periodic table. Atomic Spectra. The Zeeman Effect. Molecular Physics: Ionic and covalent binding. Rotational and vibrational energies. Molecular spectra. Nuclear Physics: Nuclear stability and binding energy. Radioactivity. Nuclear reactions, fission and fusion. Statistical Physics: The classical and quantum distribution functions. Maxwell velocity distribution in classical gases. The equipartition theorem. Blackbody radiation. The electron gas. Degenerate fermion and boson gases. Specific heat of solids and gases.

For Third Year students taking Space Science. This course may not be taken by students registered in Physics.

3- 0- 3

Credit(s): 1

PHE302A

Electromagnetic Waves

For Third Year students taking Physics or Space Science. An elective for students taking Science. This course develops Maxwell's equations in differential form, and proceeds directly to the Helmholtz equation, describing the wave propagation of electromagnetic fields. Electromagnetic waves are studied in free space, lossy media, conductors, and dielectrics, with particular attention to power transfer (Poynting vector), and the reflection and transmission of waves at interfaces (Fresnel equations). Propagation along waveguides and transmission lines are studied in detail. The modes of propagation in rectangular waveguides (transverse electric and transverse magnetic) are analyzed in terms of field amplitudes, phases, and attenuation. The guiding of waves along a transmission line is analyzed in terms of the propagation constant, characteristic impedance, input impedance, standing wave ratio, and power. Various applications of transmission lines are examined.

3- 0- 3

Credit(s): 1

PHE304A

Quantum Mechanics

Postulates of quantum mechanics, the Schrödinger equation, operators, eigenfunctions and eigenvalues, superposition and stationary states, the one-dimensional square well. Time independent perturbation theory. The hydrogen atom, energy levels, angular momentum, magnetic moment, Stark effect, Zeeman effect, He, electron spin, Hartree-Fock approximation. Slater determinants, many electron atoms, LS coupling, jj coupling, spectroscopic notation, electronic structure and Hund's rule, periodic table.

For Third Year students taking Science.

3- 0- 3

Credit(s): 1

PHE305A

Classical Mechanics

Newton's laws, applications. Calculus of variations, Lagrangian and Hamiltonian formulation. Central force motion, Kepler's laws, collisions, Rutherford scattering. Rotating coordinate systems, Coriolis force. Rigid body motion, Inertia tensor, Euler's equations.

For Third Year students taking Physics. An elective for students taking Science.

3- 0- 3

Credit(s): 1

PHE307B

Optics

Propagation of light rays in an optical system using ray matrices; Light as an electromagnetic wave, polarization, linear, circular, and elliptical; superposition, interference, thin films, Michelson interferometer; coherence, spatial and temporal; diffraction, Huygens approximation, Fraunhofer diffraction; Fourier optics, applications. These concepts are rendered tangible by a relevant choice of laboratory experiments.

For Third or Fourth Year students taking Space Science and/or Physics. An elective for other students taking Science.

2- 2- 3

Credit(s): 1

PHE331

Instrumentation

Part I: Signals and imaging

Transfer functions; Bode plots. Periodic signals, Fourier transforms, FFT, A/D conversion, sampling and Nyquist theorems, Ultrasonic waves, digital imaging.

Laboratory

Use of common laboratory instruments; Amplitude and phase measurement; FFTs, introduction to Electronics Workbench, ultrasonic waves, synthetic aperture image production.

Part 2: Sensors, Measurement and Data Acquisition

Operational amplifiers, Op-amp circuits, physics and operation of electronic devices; transducers and sensors; signal enhancement including filtering, data acquisition and transfer functions.

Laboratory

Familiarization with various electronic devices and sensors; applications of electronic devices; transducers and sensors; use of signal enhancement techniques; design and construction of automated measurement systems.

For students of the Third Year taking Physics or Space Science. An elective course for other students taking Science.

2- 2- 3

Credit(s): 2

PHE350A

Orbital Mechanics

For students of the Third Year taking Space Science. An elective for other students taking Science. Newton's laws. Two-body problem in a central force field, orbit calculations. Motion of an artificial satellite, orbit insertion, orbit transfers, perturbations.

3- 0- 4

Credit(s): 1

PHE352B

Astronomy

This course will introduce students to fundamental concepts of astronomy and the application of astronomical techniques to space operations. Electromagnetic spectrum, measurements and distances. Earth, moon, solar system, stellar structure and evolution, and galactic structure.

For students of the Third Year taking Space Science. An elective for other students taking Science.

3- 0- 3

Credit(s): 1

PHE354B

Space Systems

Review of the history of space with emphasis on Canadian contributions typical satellite orbits: effects of the environment, satellite function considerations. Satellite systems and subsystems: structure, electrical power, thermal control, propulsion and altitude control. Systems: sensors, telemetry,

surveillance, navigation, meteorology, and remote sensing. Military and scientific satellite systems, launch systems.

For students of the Third Year taking Space Science. An elective for other students taking Science.

3- 0- 2

Credit(s): 1

PHE360B**Astronomy and the Evolving Universe**

The course will discuss an understanding of our place in the Universe. Topics to be covered will include: the solar system and its constituents, the basic properties and evolution of stars and star systems, the past, present and future structure of the Universe and topics of current interest.

(May be offered in Fall Term.) An elective course for students taking Arts.

3- 0- 6

Credit(s): 1

PHE362A**Ideas and Concepts of Modern Physics**

This course gives an introduction to the conceptual structure of modern physics and will include the following topics: the concept of fields as introduced in electromagnetism, the evolution of the statistical description of matter, the ideas of relativity, the introduction of the quantum hypothesis and its development, the quantum interpretation of matter and the impact of the new concepts on contemporary thought.

Note 1: Offered in alternate years. (May be offered in Winter Term.)

Note 2: An elective course for students taking Arts.

3- 0- 6

Credit(s): 1

PHE364B**Physics Laboratory**

This laboratory course is designed to increase the familiarity of the students with physical experimentation. Students are expected to perform a variety of different experiments in solid state physics, optics, and space physics.

For students of the Third Year taking Space Science and Honours Science. An elective for other students taking Science.

0- 4- 1

Credit(s): 0.5

PHE370A**Introductory Synoptic Oceanography**

This course gives a general introduction to the oceans. The principal topics covered are: a survey of the physical properties of sea water, the distribution of salinity, temperature, etc., and their seasonal variations; the circulation of the oceans; energy budgets; oceanographic instrumentation and measurement techniques; and underwater sound velocity distributions resulting from temperature and salinity variations.

An elective for students in Science or in Arts.

3- 0- 6

Credit(s): 1

PHE380A**Physics of Armaments**

A brief history of the role of Physics in the development of weapons: ancient times, modern wars, nuclear times. Will receive special emphasis: ballistics, detonation, missiles, laser, radar; nuclear weapons receive special treatment, including nuclear principles, and the destructive and radiation effects of nuclear bombs. Certain aspects, such as ballistics and missiles, will be treated with the help of simulation computer programs.

An elective for students in Science and Arts.

3- 0- 6

Credit(s): 1

PHE390A**The Physics of Music**

An introduction to the physics of music including: physical principles of vibrating systems, waves and resonance; the physics of perception and measurement of musical sounds; hearing, intensity, loudness levels, tone quality, frequency and pitch, combination tones and harmony; the physical acoustics of musical instruments; string, brass, woodwind, percussion and keyboard instruments; musical scales and temperament; auditorium and room acoustics.

An elective course for students taking Arts or Science.

3- 0- 6

Credit(s): 1

4th Year

PHE403A**Solid State Physics**

Crystal structure, Bragg scattering and reciprocal space. Bonding in solids. Lattice vibrations and the

specific heat of solids. Energy bands. Electrical and thermal conduction in solids. Semiconductors. Dielectric and optical properties of solids. Magnetic properties of solids.

For Fourth Year students registered in Physics. An elective course for other science students.

3- 0- 3

Credit(s): 1

PHE407A

Optics

Study of the main phenomena of physical optics: Polarisation, linear, circular, and elliptical, treated using Jones' matrices, with introduction to Stokes parameters; interference; coherence, spatial and temporal; diffraction. Fourier optics, advanced geometric optics: Propagation of light rays in an optical system using ray matrices, leading to the treatment of thick lenses and a general axial optical system. These concepts are rendered tangible by a relevant choice of laboratory experiments.

For Fourth Year students taking Space Science and Honours Science (Physics). An elective for other students taking Science.

3- 2- 3

Credit(s): 1

PHE412A

Advanced Electromagnetic Theory

Various topics in electromagnetic theory are investigated in detail. Electrostatic fields are studied with attention to continuous charge distributions, the electric dipole, electric potential, polarization and boundary conditions. Magnetic fields, magnetic dipoles, and the magnetization of materials are described in terms of the magnetic vector potential. Further topics in magnetism include magnetic torque, magnetic moment, and magnetic boundary conditions. Time varying fields are shown to lead a "displacement current" in Ampère's Law, yielding the final form of Maxwell's equations. Antenna theory is developed for simple geometries, including those of the Hertzian dipole, the half-wave dipole, the quarter-wave monopole, and the small antenna loop. Other topics in antenna theory include: antenna characteristics, arrays, effective area, and radar.

For Fourth Year students taking Physics. An elective for other students taking Science or Space Science.

3- 0- 3

Credit(s): 1

PHE413B

Nuclear Physics

Nuclear constituents and Rutherford scattering. Evidence of the nuclear force. The deuteron. Binding energy and the semi-empirical mass formula. Nuclear stability. The single-particle shell model. Beta and alpha decay; gamma ray emission. Fission and fusion. Qualitative aspects of particle physics and

quark and lepton nomenclature.

For Fourth Year students taking Physics. An elective for students taking Science or Space Science.

3- 0- 3

Credit(s): 1

PHE415B**Advanced Quantum Mechanics**

The three dimensional square well. The harmonic oscillator, zero point energy, Hermite polynomials. Creation and annihilation operators. The time dependent Schrödinger equation; time evolution of states and operators, Ehrenfest's principle. Time dependent perturbation theory; transitions, selection rules, Fermi's golden rule. Scattering.

For Third Year students taking Honours Science (Physics) and an elective for Science students.

3- 0- 3

Credit(s): 1

PHE420**Senior Project**

The object of this course is to provide students with an opportunity to be involved in a project which requires them to assimilate knowledge gained from a variety of sources and apply it to a specific, well-defined problem. A formal report is required for presentation in the Winter Term, along with a prototype apparatus, if appropriate. Students are encouraged to seek out projects from any of the Science or Engineering Departments.

For students of the Fourth Year taking Honours Science.

0- 4- 6

Credit(s): 2

PHE440**Selected Topics in Physics**

This course will consist of two topics selected annually by the class from among the following: the physics of plasmas, statistical physics, low temperature physics, applied acoustics, introductory astrophysics, optical properties of solids, and other topics.

An elective course for students of the Fourth Year taking Honours Science.

3- 0- 3

Credit(s): 1

PHE442B**Introduction to Astrophysics**

The object of this course is to apply our knowledge of physics to obtain an understanding of astrophysical phenomena. The topics to be covered would be selected from: Observational Astronomy, Stars and Stellar Evolution, Galaxy Formation and Evolution, Observational Cosmology, Theory and Chronology of Big Bang, and Model of the Universe.

For students of the Fourth Year taking Space Science. An elective for students taking Science.

3- 0- 4

Credit(s): 1

PHE445A**The Physics of the Space Environment**

This course will provide a comprehensive introduction to the physical phenomena that result from the interaction between the sun and the earth. We will examine the basic processes of plasma physics and how it relates to the earth's neutral atmosphere and ionosphere. We will study in detail, the relevant transport equations and related coefficients, wave and chemical processes, energy deposition and transfer mechanisms.

For students of the Fourth year taking Space Science. An elective for other students taking Science.

3- 0- 3

Credit(s): 1

PHE448**Spacecraft Mission Analysis and Design**

The course consists of lectures and research assignments in the 1st term, and spacecraft design for a proposed space mission in the second term by the students working in teams. The teams are to submit a detailed report covering all aspects of the spacecraft design. This course fulfills the thesis requirement for an Honours degree. The proposed space mission is normally varied each year.

The lectures and research assignments will cover various aspects of a typical spacecraft mission such as: system design; orbital mechanics and propulsion; spacecraft subsystems - power, thermal, communications, attitude; risk management and reliability.

For students in Space Science and as an elective for Science or Engineering students.

0- 4- 6

Credit(s): 2

PHE450A**Space Communications and Navigation**

This course is an introduction to communication between spacecraft and ground stations. Students are introduced to antenna theory: dipole antenna, antenna gain, antenna patterns, directivity and signal strength. The theory is then applied to modulation, transmission, propagation, reception and demodulation of signals between the ground and a satellite. Fundamentals of ionospheric effects,

frequency bands, communication link equations and telemetry are covered.

Space based navigation systems are examined. Topics include positioning using RF Doppler and GPS positioning. Precision navigation and surveying, personal communication systems as well as search and rescue systems are also examined. Satellite tracking is discussed.

For Fourth Year students taking Space Science. An elective for students taking Science.

3- 0- 3

Credit(s): 1

PHE451B**Senior Physics Laboratory**

A continuation of PHE364B including experiments in magnetism, Mössbauer spectroscopy, applied optics and nuclear science.

For students of the Fourth Year taking Honours Science with a Physics concentration.

0- 4- 2

Credit(s): 1

PHE452B**Remote Sensing**

This course provides a foundation for the theory and applications of remote sensing of the earth's surface from space. Optical, infra-red and passive and active microwave sensing systems are examined from basic electromagnetic principles, through expected surface responses and atmospheric effects, to modern satellite systems utilizing these systems. Techniques of digital image processing are developed in the context of satellite imagery. Applications of remote sensing technology to terrestrial and marine environments are discussed, highlighting topics of interest to the Canadian Forces.

Lecture material is supplemented with weekly computer laboratory exercises in image processing and in the examination of different types of satellite imagery.

For students of the Fourth Year taking Space Science. An elective for students taking Science.

3- 2- 4

Credit(s): 1

PHE460B**Computational Physics**

This course covers deterministic numerical methods in physics. Students will find numerical solutions of Newton's, Maxwell's and Schrödinger's equations. Molecular dynamics. Non-linear dynamics. This course will also cover numerical solutions of partial differential equations in physics using finite elements, finite differences as well as spectral techniques. Topics will include: interpolation, regression and modeling, Monte Carlo methods, simulations in thermo-statistics.

An elective for students in Fourth year taking Science, Space Science or with the permission of the department.

3- 0- 3

Credit(s): 1

PHE462A**Statistical and Thermal Physics**

Principles of thermodynamics and statistical mechanics. First, second, and third laws of thermodynamics, equilibrium, entropy, and Kelvin temperature scale. Quantum and classical statistical ensembles. Boltzmann, Fermi and Bose distributions: ideal gases, phase transitions, fluctuations.

For students of the Fourth Year taking Honours Science. An elective for other students in Science.

3- 0- 4

Credit(s): 1

Chemistry & Chemical Engineering

1st Year

CCE101	Engineering Chemistry
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The course is designed to present the fundamental principles of chemistry with strong emphasis on application in engineering, the importance of chemistry in the modern world, and the problems created by various chemical processes. The first term is devoted to gases, chemical kinetics, acid-base and precipitation equilibria. Among the topics covered are the ideal gas law, the kinetic theory of gases, real gases, properties of acids and bases, solubilities and selective precipitation. The second term is primarily focussed on thermodynamics. The laws of thermodynamics are applied to chemical and physical changes, using combustion processes and explosions as examples. Among the topics covered are the concepts of energy, work and heat, enthalpies of reaction, the Carnot cycle, entropy changes in simple physical and chemical processes, equilibrium and Gibbs free energy. Electrochemistry is the final topic of the term. Laboratory experiments and tutorials reinforce and supplement lecture material.

For students of the First Year of Science and Engineering .

3- 2- 5

Credit(s): 2

CCE106A	Basic Chemistry
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The course begins with the classification and physical properties of matter, measurement, errors and dimensional analysis. It then progresses to chemical nomenclature, chemical formulas, valence, chemical reactions, chemical equations and stoichiometry, followed by the properties of gases, liquids and solutions. Finally, the atomic theory of matter, introduction to electronic structure, the periodic table of the elements and an introduction to chemical bonding completes this course. A laboratory accompanies this course.

Exclusion: CCE101

An introductory chemistry course for students with little or no previous background in chemistry, to prepare them for university level chemistry.

3- 2- 5

Credit(s): 1

2nd Year

CCE200A	Contemporary Chemistry
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An elective course for students of the Second Year taking Arts, and other students with the permission of the Department. This is a core curriculum course for Arts students.

This course is designed to familiarize the student with a variety of current topics which are primarily chemical in nature. Some basic chemistry will be introduced at the beginning of the course to enable

the student to comprehend the chemical systems that will be examined. The main topics to be covered include: the chemistry of water, water pollution, air pollution, modern energy sources, plastics and polymers and their environmental impact, food chemistry, agricultural chemistry, and pharmaceuticals and drugs.

3- 0- 6

Credit(s): 1

CCE218A**Physical Chemistry of Matter**

The first part of the course covers the solid, liquid and gaseous states of matter including real gases, kinetic theory, introduction to transport phenomena, ideal solutions, crystal structure and introduction to crystallography. In the second part of the course the following topics are investigated: second Law of thermodynamics, conditions for spontaneity, statistical and thermodynamic definitions of entropy. Finally the course will look at the third Law of thermodynamics and absolute entropies, standard states and standard thermodynamic functions, as well as Gibbs equations and Maxwell relations

Prerequisite: CCE101

Corequisite: MAE226 or MAE222

3- 0- 3

Credit(s): 1

CCE220A**Introduction to Materials Science and Engineering Materials**

This introductory course in the chemical science and engineering of materials is focussed on liquids and solids. It begins with a review of thermodynamics and with phase equilibrium in one and two component systems to include thermodynamic tables and charts. The Clausius and Clausius- Clapeyron equations are introduced. Raoult's and Henry's Laws are applied to liquid-vapour equilibrium. Phase diagrams for two and more component systems with liquid and solids are studied to include those for steel and other engineering alloys. The fundamentals of crystal structure and crystallography are introduced that include unit cells, and symmetry elements for metals, ionic and covalently bonded materials, which serve as the basis for the study of imperfections in solids that lead to dislocations, point and surface defects that ultimately can lead to materials failure. Diffusion mechanisms are examined based on Fick's First and Second Laws. Ceramics are studied and phase diagrams used for applications to silicates and glasses. The properties and structures of polymers are introduced for thermoplastics, thermosets and elastomers with their engineering applications. Composite materials are examined. Askeland, The Science and Engineering of Materials

Prerequisite: CCE/F101

For students of the Second Year taking Engineering.

3- 0- 3

Credit(s): 1

CCE240B**Introduction to Biological Sciences**

This is an introductory course in general biology that will prepare the students for the upper year courses, CCE/F385, 460 and 485. The basic themes and concepts of modern biology spanning organisational levels from molecules to cells to communities and populations will be covered systematically and in an evolutionary context. Effort will be made to present unifying biological and chemical concepts with examples to encourage student understanding rather than memorisation.

Prerequisite: CCE101

For students of the Second Year taking Chemical Engineering, Honours Chemistry or a Major in Chemistry.

3- 0- 3

Credit(s): 1

CCE241**Organic Chemistry**

An introductory course in organic chemistry chiefly concerned with the structure, properties, reactions and synthesis of mono-functional aliphatic and aromatic compounds. Stereochemistry and reaction mechanism theory are integral parts of the course. A brief study is also made of infrared, nuclear magnetic resonance and mass spectroscopy, including the interpretation of spectra. Simple preparations are performed in the laboratory. Methods of characterization and identification of organic compounds as well as spectroscopic methods of analysis are included in laboratory assignments.

Prerequisite: CCE101

For students of the Third Year taking Chemical Engineering, Honours Chemistry or a Major in Chemistry. An elective course for students taking other Science programs.

3- 2- 5

Credit(s): 2

CCE283**Corrosion Prevention and Control**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course describes the importance of corrosion problems in relation to material cost, reduced performance, reliability, and safety issues. The course covers the basics of what makes environments corrosive, with an introduction to corrosion chemistry. Electrochemical theory, as it applies to corrosion, is introduced with a view towards relating corrosion current and the mass and thickness loss rates of various materials. Various forms of corrosion are described in relation to failure analysis and their importance with engineering alloys typically used in the CF. The main methods of corrosion prevention and control are introduced: coatings and coating processes, inspection and monitoring, inhibitors, design considerations, and cathodic protection. The course also covers techniques to assess the economics of corrosion control strategies within the context of corrosion management.

0- 0- 9

Credit(s): 1

DL + web

CCE285 Introduction to Environmental Impact Assessment

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course prepares students to complete and review Environmental Impact Assessments. The origins, philosophies and approaches to environmental assessment are compared and discussed in detail. Different facets of the Canadian Environmental Assessment Act (CEAA) are also studied in depth, including its history, application, regulations, and process. Students are introduced to the assessment of social and economic as well as biophysical impacts; typical impacts from military operations are also discussed. Through assignments, students will apply the knowledge and skills in the application of environmental assessment at the screening level to typical projects or operations.

Prerequisite: None, although completion of CCE/CCF289 - Impact of Science and Technology on the Environment is recommended

0- 0- 9

Credit(s): 1

DL

CCE289 Impact of Science and Technology on the Environment

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course analyses the relationship between human activity and the environment. It assesses the impact of technological development on the environment and introduces such concepts as biogeochemical cycles, atmospheric processes (ozone layer, greenhouse effect, acid rain), and ecosystem self-regulation. An overview of the international environmental challenges and of current federal environment agenda will help the student develop a personal perspective on global environmental protection.

0- 0- 9

Credit(s): 1

DL

3rd Year

CCE300B Fluid Mechanics

This course emphasizes the basic concepts of fluid mechanics and includes a study of the following: fluid and flow properties, fluid statics, fundamental equations of fluid motion, control volume concept applied to the continuity, momentum and energy equations; flow measuring devices; shear stress in laminar and turbulent flow, viscous and in viscid flow; introduction to the concepts of boundary layer

and drag; engineering applications of flow in closed conduits. Special mathematical techniques, industrial and military applications are included.

Prerequisite: PHE104, MAE203 or equivalent.

For students of the Third Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE302B**Molecular Structure and Spectroscopy**

Bonding in molecules, ionic and covalent bonds, valence theory, hybridization, molecular orbitals, simple homo- and hetero nuclear diatomic molecules, polarization, correlation diagrams, delocalization, resonance, the benzene ring. Absorption and emission of radiation in molecules, radiative and non-radiative processes, selection rules, rotational, vibrational and electronic spectroscopy of small molecules, Raman spectroscopy, spectroscopy of large molecules.

Note 1: For students of the Third Year taking Honours Chemistry or a Major in Chemistry. An elective course for students taking other Science programs.

Note 2: Discontinued after 06-07

3- 0- 4

Credit(s): 1

CCE303A**Introduction to Chemical Engineering**

This course introduces the fundamentals of chemical engineering in the context of the Canadian Forces. Mass and energy balances on single and multiple unit processes involving material separation and reactions are performed. A study is also made of conventional and substitute fuels, their combustion and use by the Canadian Forces. The use of computer-aided process simulation is also introduced.

Prerequisite: CCE220

Corequisite: CCE312A

For students of the Third Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE304**Military Chemistry**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course provides a review of the basic chemistry, biochemistry and physiology required for

understanding the action and methods of protection against chemical agents. It also includes an examination of the composition and biological action of classical nerve, blood, choking, and blister agents. The course also teaches the general principles of protection, detection, decontamination methods, design hardening considerations, and available antidotes to chemical agents. (Both individual and collective protection measures are covered.) In addition, the course offers a critical review of specific equipment fielded for CB applications, chemical weapons disposal, and biological agents. The course assumes little prior background in general chemistry. By the end of the course, students should have a working knowledge of chemical agents and chemical defence principles, agent decontamination and disposal of chemical weapons, biological agents, and the current world picture regarding the potential use of chemical and biological weapons.

0- 0- 9

Credit(s): 1

DL

CCE305B**Heat Transfer**

The fundamental concepts and mechanisms of heat transfer processes are studied. The following topics in heat transfer are covered: differential equations of heat transfer, steady and unsteady state conduction in one and two dimensions using analytical and numerical; heat transfer with free and forced convection in laminar and turbulent flow; boiling and condensation heat transfer; heat transfer equipment; radiation heat transfer.

Prerequisites: PHE104, MAE203 or equivalent.

Corequisite: CCE300

For students of the Third Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE306**Hazardous Materials Management**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course gives students the tools to understand the general nature of hazardous materials and their management, as well as the specifics of the hazards presented by, and the requirements for safe handling of, the various classes of hazardous materials. The course includes a review of chemistry, including nomenclature and reaction chemistry. In addition, the various classes of hazardous materials are discussed, covering the specific nature of the hazard and selected examples of representative materials, and proper handling, storage and disposal procedures. CF/DND orders and directives and Canadian legislation relevant to hazardous materials are also examined.

Prerequisite: CCE/CCF289 - Impact of Science and Technology on the Environment

0- 0- 9

Credit(s): 1

DL

CCE308A**Physical Chemistry of Reactions**

The following major topic areas are covered in the course: Chemical potential and application of thermodynamics to phase equilibria in one and multi-component systems; Application of thermodynamics to chemical equilibria in ideal gas mixtures and ideal solutions; Activities and thermodynamics of nonideal systems; Reaction kinetics: phenomenological rate laws, mechanisms, steady state treatments, linear and branched chain reactions; Surface chemistry: Langmuir adsorption and mechanisms of heterogeneous catalysis.

Prerequisite: CEE218 or CCE220

For students taking Honours Chemistry or a Major in Chemistry. (Offered in 07-08 only)

3- 0- 3

Credit(s): 1

CCE309B**Introduction to Quantum Chemistry and spectroscopy**

This course covers the following major topic areas: Schrodinger equation for the H-atom, hydrogen-like orbitals, energy levels and atomic transitions, multi-electron atoms, variational principle, Hund's Rule. Born-Oppenheimer approximation, vibrational and rotational states. Molecular orbital treatment of diatomic molecules, hybridization and polyatomic molecules. Absorption and emission of radiation in simple molecules, selection rules, fluorescence, phosphorescence and radiationless transitions. Infrared spectroscopy.

Prerequisite: PHE225 and or PHE226

For students taking Honours Chemistry or a Major in Chemistry. (Offered in 07-08 only)

3- 0- 3

Credit(s): 1

CC310A**Chemical Thermodynamics**

Review of definitions and terminology; First Law and thermochemistry; Second Law and spontaneity; introduction to statistical thermodynamics; Third Law entropies; Chemical potential and open systems; free energy and chemical equilibria. Applications to ideal gas reactions, nonideal solutions, electrolytes and electrochemical cells.

Prerequisite: CCE217A

Note 1: For students taking Honours Chemistry or a Major in Chemistry.

Note 2: (Discontinued after 06-07)

3- 0- 4

Credit(s): 1

CCE312A**Applied Thermodynamics I**

The fundamentals are developed and applied to engineering problems in the following topics: First law in open and closed systems; volumetric properties of fluids and equations of state to include compressibility and Pitzer acentric factors for ideal and real systems with applications to isothermal, adiabatic and polytropic changes in open and closed systems; Second law and entropy applied to Carnot and Rankine cycles and the concept of lost work; ideal dilute solutions, equilibrium in condensed phases in ideal and non-ideal systems, Raoult's and Henry's Laws.

Prerequisite: CCE/F220A

For students of the Third Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE313B**Applied Thermodynamics II**

The thermodynamics is extended to multi-component liquid mixtures with a focus on free energy functions, Maxwell's equations and chemical potential; homogeneous mixtures to include partial molar properties; fugacities, activity coefficients and activities, Lewis-Randall relations and excess properties; non-electrolytes to include vapour-liquid equilibria, upper and lower critical solution temperatures, Van Laar, Margules and the Gibbs-Duhem equations; chemical reaction equilibria, reaction coordinate, equilibrium constant; power cycles for the Otto, Diesel, gas turbine and jet engines; refrigeration and liquefaction.

Prerequisite: CCE/F312A

For students of the Third Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE315B**Chemical and Materials Engineering Computations**

This course develops the mathematical background required to formulate and solve ordinary and partial differential equations arising in chemical engineering. Topics include Fourier series and orthogonal functions, the method of Frobenius and Legendre equations, and eigenfunctions expansions for the Sturm-Liouville problem. Solution of partial differential equations is done by analytical methods, including the use of Fourier and Laplace transforms methods. The course covers the numerical solutions of ordinary and partial differential equations. Probability and Statistics are covered as basis for application to the analysis of experimental results and in the design of experimental procedures and computer simulation results interpretation.

Prerequisite: MAE315

For students of the Third Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE317B**Kinetics and Surface Science**

This course develops the empirical treatment of the rate laws and orders of reaction, complex reactions, theories of reaction rates, the Arrhenius relationship and experimental methods. Introduction to combustion and explosions including chain reactions, free radicals, thermal and branched-chain explosions, delayed branching and degenerate explosions will also be introduced. The course is completed by a study of the nature and properties of surfaces of solids, physical adsorption and chemisorption; the development of Langmuir - Hinshelwood equations, the linking of kinetics and chemisorption, and heterogeneous catalysis.

Prerequisite: CCE101

For students of the Third Year taking Chemical Engineering, Honours Chemistry or a Major in Chemistry.

3- 0- 3

Credit(s): 1

CCE321**Engineering Laboratory****Part I: Microcomputers and Instrumentation**

Introduction to the microcomputer, digital logic, data acquisition, IEEE bus, multiplexers, applications to measurement and control of temperature.

Part II: Engineering Laboratory

Experiments to illustrate and complement the engineering lecture courses of the Third Year. The experiments are designed to teach students to analyse a technical situation, to reach logical conclusions from observations and to communicate findings in the form of a technical report.

0 - 3 - 3 Credit : 0.5 (Fall Term)

0 - 4 - 4 Credit : 0.5 (Winter Term)

Prerequisite: CCE101, CSE201, MAE209.

Corequisite: CCE300 , CCE303.

For students of the Third Year taking Chemical Engineering.

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Credit(s): 1

CCE337B**Seminar**

Technical, ethical, legal, environmental, and safety topics are covered by seminars given by staff and

invited speakers. Topics will be chosen to encompass and extend the technical subjects of the other courses so as to be useful to the working graduate engineer in the military.

For students of the Third Year taking Chemical Engineering, Honours Chemistry or a Major in Chemistry.

0- 0.5- 0

Credit(s): 0

CCE342B**Inorganic Chemistry**

The principles and applications of inorganic chemistry are discussed, including atomic structure, periodicity of chemical and physical properties with atomic number, molecular structure and valence bond theory. The concepts of Brønsted and Lewis acidity are developed in reference to polyprotic acids, hard and soft acidity, and hydrolysis of cations and oxo anions. Oxidation and reduction of chemical species are discussed in reference to the extraction of the elements, reduction potentials, redox stability of water and the diagrammatic representation of potential data (Frost and E-pH or Pourbaix diagrams). Aspects of the coordination chemistry of metal complexes are discussed with reference to structures and symmetries, crystal and ligand field theories, and reaction kinetics.

Prerequisite: CCE101

Note 1: For Chemistry students in Honours and Majors Programs. other students may take the course with permission of the department.

Note 2: This is a lecture course connected closely to a complementary laboratory course CCE343B

3- 0- 3

Credit(s): 1

CCE343B**Inorganic Chemistry Laboratory**

A laboratory course designed to illustrate the concepts of inorganic chemistry covered in CCE342A: redox chemistry, coordination complexes, and applications of inorganic chemistry to biochemistry, environmental science and solid state physics. Besides classical wet chemistry, the experiments require the use of various analytical instruments to study the behavior of the chemicals involved: spectrophotometer, pH meter, optical and scanning electron microscopy, differential scanning calorimeter, thermal gravimetric analyzer, and x-ray diffractometer.

Prerequisite: CCE/F101

For students of the third year taking Honours Chemistry or a Major in Chemistry.

1- 3- 4

Credit(s): 1

CCE345A**Metallurgical Laboratory**

A laboratory course designed to illustrate and augment subject matter covered in CCE353A including heat treatment, mechanical testing, casting, metallography, X-ray diffraction, phase diagrams and chemical analysis.

Prerequisite: CCE/F220A

For students of the Third Year taking Chemical Engineering or Honours Chemistry. An elective course for students taking other science programs.

0- 3- 3

Credit(s): 0.5

CCE351A**Nuclear Science**

From a review of current atomic structure models, the several processes of radioactive decay are explained and discussed, followed by the various nuclear reactions, including the fission process. The interactions of the various types of radiation with matter are covered, and are used as the basis for covering subsequent subjects such as radiation detection and measurement, and shielding against radiation. The students then learn how radiation affects the living tissues, and the concepts of health physics are introduced, leading to defining the radiation dose concepts and units and to the subject of radiation protection and safety. Several examples of applications of radioisotopes and radiation are then presented in areas as diversified as nuclear medicine, research, analysis, food preservation, radiation processing in the chemical industry and smoke detectors. Emphasis is given to applications of interest to the Canadian Forces, such as the neutron-based anti-personal land mine detector.

Prerequisites: MAE201, MAE203

For students of the Third Year taking Chemical Engineering. An elective course for students of the Third Year taking Honours Science or a Major in Science.

3- 0- 3

Credit(s): 1

CCE353A**Materials Science**

Topics included are mechanical testing, binary and ternary phase equilibrium (thermodynamic background and graphics), metallography and optical microscopy, X-ray diffraction of single crystals and polycrystalline metals, solidification and grain growth, dislocation theory and plastic deformation, recovery, recrystallization and grain growth, commercial heat treatment practices, carburization and nitriding of steel. Particular reference is made to the metallurgy of iron and carbon steel, stainless steels, aluminum, magnesium and copper-based alloys as well as superalloys intended for high temperature service in gas turbines. Common metal fabrication techniques and repair processes such as welding and brazing are presented. Important non-destructive testing techniques are covered and the principles of fracture mechanics are introduced.

CCE/F220A

For students of the Third Year taking Chemical Engineering. An elective course for students taking other science programs.

3- 0- 3

Credit(s): 1

CCE360A**Environmental Sciences: Hazardous Materials**

The course is designed to assist the young officer in the role of Base Environmental Officer or Unit General Safety Officer, roles that the officer must fill regardless of Classification. Topics include the properties of flammable, corrosive, reactive, toxic and radioactive materials; handling and storage techniques; safe disposal methods of radioactive and non-radioactive wastes. The impact of various materials on living systems and the environment will be explored.

Prerequisite: CCE106A or CCE200A

Note 1: A core curriculum course

Note 2: An elective course for students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

CCE362A**Environmental Sciences: Energy**

Traditional energy sources and the associated technology are reviewed including those of fossil resources, hydroelectric power, and nuclear fission. The required raw materials, their world-wide occurrence and distribution will be examined in a political, strategic and economic context. Methods to determine the Total Unit Energy Costs will be outlined and the various sources of energy compared economically. Novel energy sources including solar, wind, geothermal, hydrogen and fusion are studied. Various aspects of the hydrogen economy will be explored. The environmental risks and social impact of large scale energy production are discussed.

Prerequisite: CCE/F106A or CCE/F200A

Note 1: A core curriculum course.

Note 2: An elective course for students of the Third or Fourth Year taking Arts.

3- 0- 6

Credit(s): 1

CCE363B**A Chemical Engineering Perspective of CBRN Defence**

The course will include an examination of the composition and biological action of classical nerve, blood, choking and blister agents, as well as detection and decontamination methods and antidotes available. Individual and collective protection measures will also be covered. Such biological agents as bacteria, viruses, fungi and rickettsia, as well as mid-spectrum agents to include toxins, venoms and bioregulators, will be addressed. Radiological weapons will be discussed in terms of variety and biological threat. The principles and characteristics of nuclear weapons will be introduced and related to the physical (thermal, blast) and nuclear radiation (initial, residual, TREE, EMP) effects on humans, structures and equipment. Particular attention will be paid to distance-yield relationships, the distribution of fallout, the characteristics and pathology of acute whole-body radiation, physical and biological dosimetry and radiological survey. In addition to the above topics, aspects of engineering

design will also include issues of Chemical Weapons Convention verification, detection technologies and industrial-level chemical agent destruction.

Prerequisites: CCE/F303, CCE/F351.

Note 1: Not available for credit for students who also claim ATWOP, LFTSP, CCE/F304, CCE/F 364 or CCE/F474.

Note 2: An elective course for students of the Third or Fourth Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE364B	Military Chemistry: Munitions and Chemical Defence
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Topics that will be covered, in a largely qualitative manner, include the nature, physiology and pathology, prophylaxis, detection and decontamination of classical chemical agents, such as nerve, vesicant, choking and blood agents and classical biological agents, such as viruses, bacteria, fungi and rickettsia. Radiological weapons will be discussed from the perspective of the variety of options and the biological hazard posed. Also covered will be the effects of nuclear weapons on vehicles, structures and personnel. Specific radiological and nuclear topics will include detection and dosimetry, and the distinct hazards posed by alpha, beta, gamma and neutron radiation. Protective measures, both individual and collective, counter NBC agents, will also be discussed.

Prerequisite: CCE/F106A or CCE/F200A

Note 1: Not available for credit for students who also claim ATWOP, LFTSP, CCE/F304, CCE/F363 or CCE/F474.

Note 2: An elective course for students of the Second, Third or Fourth Year taking Arts. A core curriculum course.

3- 0- 6

Credit(s): 1

CCE365B	Environmental Engineering
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This course begins by examining the sources, properties, fate and treatment of solid, liquid and gaseous wastes. Water and wastewater treatment, solid waste disposal - including radioactive waste - and air pollution are investigated. Contaminated site investigation procedures, environmental regulations and guidelines, and site remediation methods are reviewed as are environmental management systems. A unifying theme is the fact that environmental engineering problems must be solved using a holistic approach that incorporates the role of ethics in decision making and implements pollution prevention strategies to reduce waste streams. The importance of risk communication is highlighted. Case studies and material from the current technical literature are used to illustrate key points and applications.

Prerequisite: CCE/F101

3- 0- 3

Credit(s): 1

CCE366B Environmental Sciences: Impact of Technology on the Environment

The concept of energy is introduced by discussing the definition, terms, units, use, resources, conversion and conservation. The laws of thermodynamics, temperature, heat transfer, heat engines and heat pumps are briefly covered. Conventional energy sources (fossil, hydroelectric, fission) are studied as well as alternate sources (solar, wind) and currencies (electricity, hydrogen). The environmental impact of these sources is included. Group seminars on specific topics, such as energy sources and uses of interest to DND, are presented.

Prerequisite: CCE/F106A or CCE/F200A

Note 1: A core curriculum course.

Note 2: An elective course for students of the Third or Fourth Year taking Arts.

Note 3: Not offered in 2006/2007

3- 0- 6

Credit(s): 1

CCE385A**Biotechnology**

This course involves the basic principles of chemistry, biochemistry and microbiology applied to environmental systems and problems. The fundamentals and principles of biochemistry, including important biomolecules, bioenergetics and kinetics are discussed. A systematic and quantitative description is given for the necessary inorganic and organic reactions in aerobic and anaerobic media, biokinetics, medium formulation, growth rates and population dynamics, sterilization and genetic engineering. Applications include waste water treatment, bioremediation, fermentation processes and the design and analysis of bioreactors.

Prerequisite: CCE240, CCE241

For students of the Third Year taking Chemical Engineering or Honours Chemistry, or a Major in Chemistry. An elective course for students taking other Science programs.

3- 0- 3

Credit(s): 1

CCE386**Introduction to Environmental Management Systems**

Only offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

This course provides an overview of the principles of environmental management. The ISO 14001, the Standard for Environmental Management Systems (EMS), is the International standard for environmental management adopted by industry and governments worldwide, and the Canadian federal government has adopted the principles of this standard for all federal departments and organizations. These key principles are the focus of this course, and discussions include how to implement EMS in an organization. A detailed examination of the definitions and requirements of ISO

14001, as well as of the concepts of environmental performance indicators, encourage students to think about environmental responsibility.

Prerequisite: CCE/CCF289 - Environmental Sciences: Impact of Science and Technology on the Environment.

0- 0- 9

Credit(s): 1

DL

4th Year

SCE420

Senior Project

The purpose of this course is to offer the possibility of doing an in-depth study of a scientific topic in which the student is particularly interested. The format is flexible and depends on the topic area. At one end of the spectrum, the student could be associated with a research team in either Physics, Chemistry or Mathematics, and be given responsibility for part of a research project. At the other end, the student may choose a programme of independent study under the supervision of a member of the faculty. In all cases, the student's progress would be regularly monitored and an interim report would be submitted by the student at the end of the Fall term. The final mark would be based on a combination of assessment by the faculty supervisor(s) and an oral presentation to the Honours Science students and a faculty assessment committee.

For students of the Fourth Year taking Honours Science.

0- 4- 4

Credit(s): 2

CCE401

Nuclear Science and Engineering

Atomic structure, radioactive decay and nuclear reactions, including the fission process, are discussed. The interaction of radiation with matter, radiation detection and measurement, shielding, health physics and safety are studied. Nuclear reactors are covered under the topics of reactor types and components, criticality and steady-state operation, and reactor kinetics and control. The selection and behaviour of materials for nuclear applications are covered. A survey of the nuclear fuel cycle from a chemical engineering perspective, reactor safety and energy conversion, electricity production, thermonuclear fusion and military applications completes the course.

2 - 0 - 2 (Fall Term)

2 - 0 - 2 (Winter Term)

Prerequisites: MAE/F315, CCE/F220A, CCE/F300A, CCE/F303A, CCE/F305B.

For students of the Fourth Year taking Chemical Engineering. An elective course for students of the Fourth Year taking Honours Science or General Science.

2- 0- 2

Credit(s): 1

CCE405**Mass Transfer Operations**

This course in unit operation design concentrates primarily on materials separation and purification in fluid systems. Military applications are found in fuels processing, pollution abatement, undersea and space life support systems, chemical and biological defence, and other areas of ultimate defence significance. Environmental applications are found in air pollution abatement. The following topics in mass transfer are included: molecular and eddy diffusion, mass transfer coefficients, interphase mass transfer, and mixing. Phase equilibrium behaviour and correlations are reviewed and extended from an engineering point of view. Equipment design, performance, and efficiency are examined in both stagewise and continuous contacting. Generalized design equations are derived and applied. Individual separation techniques are studied, with gas absorption and fractional distillation emphasized because of their prime importance in fluid system separations. Other separation techniques, including adsorption, liquid-liquid and solvent extraction, and membrane separations are also covered.

2 - 0 - 2 (Fall Term)

2 - 0 - 2 (Winter Term)

Prerequisites: CCE/F300A, CCE/F303A, CCE/F305B, CCE/F312A, CCE/F313B, CCE/F341.

For students of the Fourth Year taking Chemical Engineering.

2- 0- 2

Credit(s): 1

CCE407B**Reaction Engineering**

This course builds on the material of CCE317B and introduces students to the analysis and design of chemical reactors as employed in materials conversion and purification systems. Homogeneous and heterogeneous reactions in single ideal batch and flow reactors, and in reactor combinations, are studied. The analysis of real reactors is introduced. As part of the design function, optimization of reactor performance is introduced.

Prerequisites: CCE300, CCE303, CCE305, CCE312, CCE313, CCE317, CCE241, CCE405.

For students of the Fourth Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE409B**Combustion and Explosion Engineering**

The study of the physical and chemical processes associated with applied combustion science that include concepts from thermodynamics, chemical kinetics, fluid mechanics, mass transfer and heat transfer. Also studied are pre-mixed and diffusion flames, combustion suppression and combustion

pollutants. An introduction is given to energetic materials, explosions and gun propellants.

Prerequisites: CCE/F303A, CCE/F312A, CCE/F313B, CCE/F317B, CCE/F405A.

Elective for students of the Fourth Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE413B**Systems Analysis: Modelling and Optimization**

The formulation of mathematical models from word statements of engineering problems and digital computer simulation are emphasized in this course. The students are introduced to the methods of computer simulation of engineering systems as used within the industry, for the prediction of the (steady-state) behaviour and performance of various processes and systems of contemporary and future significance to the Canadian Forces. Several modern optimization techniques are studied and applied to solve optimization problems by numerical methods on computers. Economic models are examined for process systems in terms of the relationships between physical and economic parameters.

Prerequisites: CCE/F300B , CCE/F303A, CCE/F305B, CCE/F407A, MAE/F315A, CCE/F315B, CCE/F351A, CCE/F405A.

For students of the Fourth Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE415A**Control Systems and Instrumentation**

This course emphasizes the basic concepts of control system analysis. Topics include: review of the Laplace transforms; transfer functions and responses of open-loop systems; measurement techniques; analysis of linear closed-loop systems including control system, closed-loop transfer functions, transient response and stability; frequency-response methods; direct digital control (DDC) covering the functions of digital computers for control of industrial processes, analysis of sampled data, response and stability of open and closed-loop sampled systems. Practical examples are selected from various courses in the programme.

Prerequisites: CCE/F300B, CCE/F303A, CCE/F305B, MAE/F315A, CCE/F315B, CCE/F351A

Corequisite: CCE/F405A,

For students of the Fourth Year taking Chemical Engineering.

3- 0- 3

Credit(s): 1

CCE417**Design Project**

The purpose of this course is to permit each engineering student, normally working as one of a group,

to participate in the engineering design of a process or system. Emphasis is placed on design techniques, on the integration of material taught in previous science and engineering courses, on design project organization and administration, and on economic evaluation of the system being designed. Ethical concerns such as safety, environmental and societal impact of engineered systems are also integral parts of the projects. The course includes two oral presentations as well as a written technical report that develop the student's skill in oral and written communication. When possible, students are encouraged to present their work at student conferences. Design projects are selected, where possible, based on current and foreseen engineering applications in the Canadian Forces which fall within the scope of the programme, and may involve direct liaison with DND technical establishments and directorates.

0 - 2 - 2 (Fall Term)

0 - 4 - 4 (Winter Term)

Prerequisite: Successful completion of 3rd year chemical engineering or special permission from the department head.

For students of the Fourth Year taking Chemical Engineering.

0- 2- 2

Credit(s): 2

CCE421	Engineering Laboratory
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In this laboratory course, the student carries out experiments to illustrate and complement the engineering lecture courses of the Fourth Year. The experiments are designed to teach students to analyse a technical situation, to reach logical conclusions from observations and to communicate findings in the form of a technical report.

0 - 3 - 3 (Fall Term)

0 - 3 - 3 (Both Terms)

Prerequisites: CCE/F300B, CCE/F303A, CCE/F305B, CCE/F321

Co-requisite: CCE/F405A, CCE/F407B.

For students of the Fourth Year taking Chemical Engineering.

0- 3- 3

Credit(s): 1

CCE425A	Materials Engineering: Polymers and Materials Selection
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CCE425(1): Polymers

Prerequisites: CCE/F220A, CCE/F241.

A course in polymer science, technology and engineering, including the chemistry and kinetics of

polymerization, polymerization processes, characterization of polymers, mechanical properties of polymers, and fabrication processes. Selected topics in industrial and engineering plastics include reinforced plastics and composites as well as elastomers.

CCE425(2): Materials Seminar (discontinued after 06-07)

Prerequisites: CCE/F425 I, GEE/F265A, GEE/F231B.

Groups of students are given part design problems in which they are required to: (i) develop detailed part and material specifications, (ii) select an appropriate material, (iii) chose a processing technique and (iv) design the process tooling. The design is presented to the class in a seminar format. The intent of the course is to synthesize topics covered in foregoing courses with a view to developing an ability to make rational choices in materials selection.

3 - 0 - 3 (Fall Term)

1 - 1 - 2 (Winter Term)

For students of the Fourth Year taking Chemical Engineering. An elective course for students taking other Science programs.

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Credit(s): 2

CCE427	Corrosion and Electrochemical Power Sources
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The course covers the fundamentals of electrochemistry and considers their application in corrosion control as well as in the understanding of electrochemical energy storage systems. Fundamental topics include: electrochemical transference, ionic mobility, conductivity; thermodynamics of ions and electrochemical reactions as well as Pourbaix diagrams; polarization and electrochemical kinetics influenced by charge transfer and mass transport; mixed potential diagrams in the understanding of competing electrochemical reactions. Practical material in relation to corrosion is introduced where appropriate to illustrate the foregoing principles and includes cathodic and anodic protection, passivity, use of inhibitors and coatings; kinetics of scale growth in high temperature corrosion, and materials selection in relation to economic factors. Engineering materials in relation to power sources include construction of important primary and secondary cells as well as fuel cells. Specific reference is made to energy and power density, maintenance, service life as well as cost considerations.

3 - 0 - 3 (Fall Term)

2 - 0 - 2 (Winter Term)

Prerequisites: CCE/F220A, CCE/F353A

Note 1: Discontinued after 2006/2007

Note 2: For students of the Fourth Year taking Chemical Engineering. An elective course for students taking other Science programs.

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Credit(s): 2

CCE428**Electrochemistry**

The course covers the following topics: definition, coulometry, current efficiency, typical electrochemical cells and electrical energy storage/utilization: primary cell (MnO₂-Zn), secondary cell (Pb-acid), fuel cell (SOFC), plating (Watts Ni), winning (Zn-acid) and refining cells (Cu-acid); electrolytic conductance: strong and weak electrolytes, ionic mobility, transference number, ionic diffusivity, limiting current, anode blocking; Throwing power of electroplating systems; Electrolytic conductance in molten salts and oxides; Thermodynamics of cells, Nernst equation; Thermal exchange accompanying electrolysis; Concentration cells and electrometric probes, Electrochemical conventions for ions in aqueous solution, reference electrodes, standard electrode potential, ionic activity and Debye-Huckel equation; Thermodynamic properties of ions in aqueous electrolytes; Electrode overvoltage and its measurement; Significance of hydrogen overvoltage in aqueous electrochemistry; Butler-Volmer equation and simplified forms; Exchange current density concept; Concentration overpotential; Passivity and overvoltage; Multiple reactions at one electrode; Implications on current efficiency, energy consumption and cell operation; Modelling the performance of an electrochemical cell. The course ends with a discussion of power cells and fuel cells in relation to electrochemical concepts developed in course.

Prerequisites: CCE/F220A, CCE/F353A.

For students of the Fourth Year taking Chemical Engineering. An elective course for students taking other Science programs

3- 0- 3

Credit(s): 1

CCE429B**Corrosion**

The principles of corrosion are applied to solving modern technological problems. The course covers the following topics: units and forms of corrosion; economic implications; materials in relation to environments; electrochemical concept of corrosion; corrosion current density; aqueous versus dry (high temperature) corrosion; Redox potential-pH (Pourbaix) diagrams; their use in active, passive and immune classification concept; development from electrochemical and thermochemical data; limitations and circumvention thereof; extension to systems involving complexing ions and alloys; mixed potential (Evans) diagrams; concept of corrosion potential and rate controlling reaction; effects of galvanic coupling; flow assisted corrosion; differential aeration; passivation; development of mixed potential diagrams for polarization studies; corrosion control; sacrificial systems; impressed current cathodic and anodic protection, inhibitors and non-metallic coatings; corrosion monitoring and testing techniques emphasizing electrochemical methods. The course concludes on the topic of high temperature corrosion: calculation of predominance diagrams and their use, scale adhesion and growth, internal oxidation of alloys and environmental modifications.

Prerequisites: CCE/F220A, CCE/F353A, CCE/F427A.

For students of the Fourth Year taking Chemical Engineering. Elective course against CCE/F409B Combustion and Explosives Engineering

3- 0- 3

Credit(s): 1

CCE437B**Seminar**

Technical, ethical, legal, environmental and safety topics are covered by seminars given by staff and invited speakers. Topics will be chosen to encompass and extend the technical subjects of the other courses so as to be useful to the working graduate engineer in the military.

For students of the Fourth Year taking Chemical Engineering or Honours Chemistry.

0- 0.5- 0

Credit(s): 0

CCE440**Special Topics**

This course will consist of topics selected from the subject areas of inorganic materials, polymeric materials, organometallic chemistry, molecular spectroscopy, electrochemistry and corrosion, adsorption among others.

An elective for students in the Fourth Year taking Honours Chemistry or a Major in Chemistry.

3- 0- 6

Credit(s): 2

CCE441A**Materials Analysis Laboratory**

This is a laboratory course supported by introductory and experiment-specific lectures. Students review standard techniques associated with instrumental analysis, and become familiar with the operational structure of modern analytical laboratories. Theoretical skills are applied to laboratory experiments focusing on the analysis of soil, water, polymer and metal matrices using extraction, digestion and non-destructive analysis. A mix of conventionally structured and student-designed experiments are undertaken. Instrumentation used includes ion and gas chromatographs, mass spectrometers, and neutron activation equipment. Data interpretation considers results in the context of regulatory frameworks and decision-making processes. Students complete laboratory work and prepare reports individually and in small groups. They use several reporting formats, including briefing notes and traditional laboratory reports, to communicate their results.

Prerequisite: CCE/F220A.

For students of the Fourth Year taking Chemical Engineering, Honours Chemistry, or a Major in Chemistry. An elective course for students taking other Science programs.

1- 3- 5

Credit(s): 1

CCE445B Materials in the Space Environment

The effects of the space environment on properties of various materials are studied. The impact of the space environment on metals, ceramics, polymers and composites is considered to include an examination of the design and performance requirements. Comparisons of the effectiveness of the various materials in space are reviewed.

Prerequisite: CCE/F220A or CCE/F217A

For students of the Fourth Year taking Space Science. An elective for students in the Fourth Year taking Honours Science or I a Major in Science.

3- 0- 3

Credit(s): 1

CCE451A Topics in Physical Chemistry

Kinetic theory: Maxwell distribution, collision theory, introduction to transport processes; Chemical kinetics: mechanisms, rate laws, temperature dependence, transition state theory; Surface chemistry: physisorption, chemisorption, adsorption isotherms, catalysis, surfactants, colloids, modern experimental methods; Polymers: structures, types, properties, polymerization mechanisms.

Prerequisites: CCE308A, CCE309B

For students taking Honours Chemistry or a Major in Chemistry.

3- 0- 4

Credit(s): 1

CCE460A An Introduction to Metabolism.

This course will study the major metabolic (anabolic and catabolic) pathways in plants and animals. The course begins by looking at the structure of proteins and the kinetics associated with their catalytic (enzyme) activity. We will study the chemical reactions within the glycolytic, citric acid and oxidative phosphorylation pathways and we will investigate how fats, proteins and polysaccharides enter into (catabolism) and leave (anabolism) these pathways. In addition, we will study how photosynthetic organisms are able to generate oxygen from water and how they reduce carbon dioxide to sugar. The course finishes by looking at the relationship between proteins, RNA and DNA.

Prerequisite: CCE/F101

For students taking Honours Chemistry or a Major in Chemistry.

3- 0- 4

Credit(s): 1

CCE474B Molecular Mechanisms of Chemical and Biological Warfare Defence

This course will provide an in-depth examination of the science and engineering principles that are involved with the use of Chemical and Biological Warfare agents and the equipment utilized to support operations in these specific threat environments. Topics that will be covered in this class include synthesis and fabrication of CB agents, the physiological effect of each class of warfare agent, medical countermeasures and principles of decontamination and routes of dissemination and detection technologies. Students must have the necessary preparation in biochemistry and physical and organic chemistry as reflected in the prerequisites.

Prerequisites: CCE/F241, CCE/F240B, CCE/F218A.

For students taking Honours Chemistry or a Major in Chemistry.

3- 0- 3

Credit(s): 1

CCE485B

Enviromental Engineering

Also offered through the Division of Continuing Studies. Please refer to the [Division of Continuing Studies](#) for more information.

The objective of this course is to examine the sources, properties, fate and treatment of solid, liquid and gaseous wastes. Water and wastewater treatment, solid waste disposal -including radioactive waste- and air pollution will be investigated. Contaminated site investigation procedures, environmental regulations and guidelines, and site remediation methods will be reviewed as will environmental management systems. A unifying theme will be the fact that environmental engineering problems must be solved using a holistic approach that incorporates the role of ethics in decision making and implements pollution prevention strategies to reduce waste streams. The important of risk communication will be highlighted. Case studies and material from the current technical literature will be used to illustrate key points and applications.

Prerequisites: CCE/F101.

An Elective course for students of the Fourth Year taking Chemical Engineering, Honours Science, or a Major in Science

3- 0- 3

Credit(s): 1

Civil Engineering

2nd Year

GEE231B**Introduction to Mechanics of Materials**

Topics include a review of statics; stress and strain in axially loaded members; elastic torsion of circular members; bending stresses in beams; axial force, shear and bending moment diagrams; shearing stresses in beams; compound stresses; principal stresses; plane stress; combined loading.

Laboratory exercises include: tension, torsion, and bending tests.

Prerequisites: PHE/F103, PHE/F205A.

For students of the Second Year taking Engineering.

2- 2- 4

Credit(s): 1

GEE235B**Introduction to Earth Sciences**

Fundamentals of physical and structural geology. Mineral and rock identification and classification. Introduction to hydrogeology (occurrence, flow and quality of groundwater). Geological and Engineering aspects of soils in cold regions.

For students of the Second Year taking Civil Engineering.

3- 2- 5

Credit(s): 1

3rd Year

CEE303A**Strength of Materials**

Review of statics; two and three-dimensional linear elasticity; bar and beam equations; various beam equations and analysis of beam-columns; nomographs; introduction to plasticity; yield criteria.

Prerequisite: GEE/IGF231B

For students of the Third Year taking Civil Engineering.

3- 2- 5

Credit(s): 1

CEE305B**Structural Theory**

Loads according to the National Building Code of Canada, structural systems and load transfer,

superposition principle; work and energy; virtual work, unit load method, method of consistent deformation; influence lines; slope deflection method; and approximate methods for lateral and gravity loads.

Prerequisites: CEE/GCF303A, CEE/GCF317A

For students of the Third Year taking Civil Engineering.

3- 2- 5

Credit(s): 1

CEE311B Engineering Materials and Introduction to Steel and Timber Design

Topics include: mechanical properties of steel, fatigue, brittle fracture, residual stresses, welding types and properties of steel construction .

Steel design is introduced by topics such as limit state design; design of tension members, beams, compression members, and the design of beam columns.

Timber design includes the property, use and preservation of timber; design of tension members, beams, columns, and connections.

Prerequisite: CEE303A

Corequisite: CEE305B

For students of the Third Year taking Civil Engineering.

3- 2- 5

Credit(s): 1

CEE317A Civil Engineering Analysis I

Ordinary and partial differential equations that apply to Civil Engineering problems are derived. Analytical and numerical solutions of specific problems are developed. Problems studied include: structural vibration, beam deformation, groundwater flow, consolidation of soil and others developed in coordination with the needs of departmental courses.

Statistical analysis of data will also be studied.

The course is intended to develop the students' abilities in structured computer programming and in the application of the computer to Civil Engineering problems. A significant proportion of the course will entail computer use.

Prerequisites: MAE/F203, MAE/F229A, MAE/F209

For students of the Third Year taking Civil Engineering.

2- 2- 4

Credit(s): 1

CEE319B**Civil Engineering Analysis II**

This course represents a direct continuation of course CEE/GCF317A and simply extends the range of problems considered, whilst following the same approach of mathematical formulation, numerical solution and computer applications.

Prerequisite: CEE/GCF317A

For students of the Third Year taking Civil Engineering.

2- 1- 3

Credit(s): 0.5

CEE343A**Hydrology**

Introduction to the hydrologic cycle. Study of rainfall-runoff relationship. Presentation of the unit hydrograph theory. Application of statistics in hydrology. Study of hydrologic and hydraulic routing techniques. Review of the principles of fluid mechanics. Presentation of ground water flow equations. Presentation of the principles of drinking water and wastewater flow rates estimation. Introduction to storm water management, and to urban flow simulation models.

At the end of the course, the student should be able to calculate and predict the flow rate that can be expected at specific locations of a watershed for given hydrologic conditions.

Prerequisite: MAE/F203

Corequisite: MEE/GMF315A

For students of the Third Year taking Civil Engineering.

2- 1- 3

Credit(s): 1

CEE355A**Soil Mechanics**

Physical properties of soils, classification, plasticity, mass-volume relationships, compaction. Seepage, in-situ stresses and effective stresses, stress distribution. Consolidation, shear strength.

Prerequisites: GEE/IGF235B, GEE/IGF231B

For students of the Third Year taking Civil Engineering.

3- 2- 5

Credit(s): 1

CEE360A**Geomatics I**

In this first geomatics course, topics include: surveying principles, error analysis, instrument checks and calibrations, measurements, trigonometric calculations, projections, coordinate systems, detail surveys, route construction surveys, and project planning. Equipment includes levels, theodolites, total stations, and GPS (Global Positioning System) receivers.

Upon completion of this course, students can plan and carry out surveying work for civil engineering projects.

For students of the Third Year taking Civil Engineering.

2- 2- 4

Credit(s): 1

CEE362B**Geomatics II**

In this second geomatics course the emphasis is on the study of the mapping sciences and least squares analysis. Topics include: geographic information systems, remote sensing, digital image processing photogrammetry, cartography and the adjustment of survey observations.

Upon completion of this course, students can analyse survey network computations and use mapping science tools to support civil engineering projects.

Prerequisite(s): CEE360A, CEE317A

For students of the Third Year taking Civil Engineering.

2- 2- 4

Credit(s): 1

CEE363B**Survey Field School**

During this course, students plan and conduct simple horizontal and vertical control networks for the production of detail and construction surveys. Activities include: laying out circular, spiral and vertical curves; calculating earthwork volumes (cut/fill); producing topographic maps; and collecting data for input into a geographic information system.

Upon completion of this course, students can plan and carry out geomatics projects to meet civil engineering needs. These abilities will be put to immediate use during the third year civil engineering project following this course.

Two weeks duration, following Winter Term examinations

Prerequisite(s): CEE362B

For students of the Third Year taking Civil Engineering.

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Credit(s): 1

CEE385A Introduction to Environmental Engineering

Presentation of water quality parameters. Description of typical water and wastewater treatment plants. Presentation of dissolved oxygen sag curve. Introduction to soil degradation processes. Discussion of solid and hazardous wastes treatment and disposal options. Introduction to site environmental assessment. Study of environmental impact assessment methodologies. Discussion of air quality parameters. Description of typical air treatment units.

At the end of the course, the student should be able to identify water and air quality parameters, and select appropriate treatment or disposal options for air, water, or soil pollutants.

Prerequisites: CCE/F101, MAE/F203

For students of the Third Year taking Civil Engineering.

3- 1- 4

Credit(s): 1

CEE387B Highway Design

Classification of soils as pavement subgrades, compaction, drainage, frost susceptibility and frost action. Introduction to analysis of stresses and strains in layered systems. Concept of pavement failure, road materials - aggregates, binders, bituminous mixtures. Function and composition of pavement layers. Stabilization. Introduction to methods of design of rigid and flexible pavements. Geometric design of roads and intersections.

Prerequisite(s): CEE317A, CEE343A, CEE355A

For students of the Third Year taking Civil Engineering.

3- 2- 5

Credit(s): 1

4th Year

CEE403A Introduction to Concrete and Reinforced Concrete Design

Topics include: concrete technology, introduction to limit states design for reinforced concrete structures, analysis and design of rectangular and T-beams for flexure and shear; bond stresses and development length of reinforcement.

Laboratory exercises include: mixing, admixtures, curing, aggregate tests, strength tests for concrete; fabrication and testing of a reinforced concrete beam.

Prerequisite: CEE/GCF303A

For students of the Fourth Year taking Civil Engineering.

2- 2- 4

Credit(s): 2

CEE405A**Structural Analysis**

Stiffness method: plane and space trusses; beams; plane and space frames; grids. Finite element method: beams and trusses; triangular and quadrilateral elements for plane stress, plane strain and plates.

Application of in-house and commercial structural analysis programs.

Prerequisites: CEE/GCF305B, CEE/GCF319

For students of the Fourth Year taking Civil Engineering.

3- 2- 5

Credit(s): 1

CEE415B**Reinforced Concrete Design**

Topics include: Analysis of Loads, continuity in structures, continuous beams and girders; design of one-way and two-way slabs; columns, footings; and introduction to prestressed concrete. A major assignment will be an integrated complete design of a 10-storey office building.

Prerequisites: CEE/GCF403A, CEE/GCF405A

For students of the Fourth Year taking Civil Engineering.

3- 2- 5

Credit(s): 1

CEE417A**Steel Design**

Topics include: connections; plate girders, composite structures, steel bridges, and P-Delta effects in steel structures. Term projects include: design of bridges, industrial buildings and task structures.

Prerequisite: CEE/GCF311B

Corequisite: CEE/GCF405A

For students of the Fourth Year taking Civil Engineering.

3- 1- 4

Credit(s): 1

CEE 443A**Urban Hydraulics**

Review of principles of fluid mechanics, and of flow rates estimation. Study of flow in pressure conduits. Presentation of urban water supply and distribution systems design techniques. Study of open channel flow. Presentation of sewage and storm water collection systems design techniques.

At the end of the course, the student should be able to calculate the conduit or channel dimension required to carry a given flow rate under specified conditions.

Prerequisite: CEE/GCF343A

For students of the Fourth Year taking Civil Engineering.

2- 1- 3

Credit(s): 1

CEE457B**Foundations, Earthworks and Slope Stability**

Bearing capacity; analysis and design of shallow and deep foundations; settlements, soil-structure interaction. Earth pressure theories; analysis and design of rigid, flexible and braced retaining structures. Slope stability; analysis and design of cuttings and embankments, performance of natural slopes. Construction methods. Site investigation.

Prerequisites: CEE/GCF355A, CEE/GCF319B

For students of the Fourth Year taking Civil Engineering.

4- 2- 6

Credit(s): 1.5

CEE485B**Sanitary and Environmental Engineering**

Review of relevant chemistry (basic, acid-base, organic) and biochemistry notions. Study of the ways to measure organic matter in water and wastewater. Presentation of relevant microbiology notions. Analysis of common reactor configurations and reaction rate equations. Study (including numerical analysis and design) of physico-chemical treatment processes (screening and sedimentation, aeration, coagulation and flocculation, filtration, disinfection) and of biological treatment processes (aerobic treatment, biological reactor design). Introduction to anaerobic treatment processes.

At the end of the course, the student should be able to design the main components of a water and of a wastewater treatment plant, and identify key design parameters and design issues.

Prerequisite: CEE/GCF385A

For students of the Fourth Year taking Civil Engineering.

4- 2- 6

Credit(s): 1.5

CEE489A**Transportation Planning**

Characteristics of different modes of transport. The land use/urban transportation planning process. Transportation studies, data collection and analysis, demand models, forecasts. Traffic flow and capacity, level of service and freeway operations.

Prerequisite: CEE/GCF319B

For students of the Fourth Year taking Civil Engineering.

3- 2- 5

Credit(s): 1

CEE493**Civil Engineering Project**

This course consists of practical projects undertaken by Fourth Year Civil Engineering students. Project topics are selected from proposals submitted by the Department of National Defence and are subject to the approval of the Department of Civil Engineering. The course consists of practical civil engineering fieldwork to be conducted after the Third Year, and an engineering design to be completed during the Fourth Year. Students are required to make oral presentations at the end of each term during the Fourth Year.

An engineering report will be submitted at the end of the course.

Fieldwork: 0-4-4

Fall: 1-2-3

Winter: 1-3-4

Co-requisites: Appropriate 4th year courses. Topic depend on department approval.

For students of the Fourth Year taking Civil Engineering.

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Credit(s): 2

Electrical & Computer Engineering

2nd Year

GEE241B**Electrical Technology**

For students in Mechanical and Chemical Engineering. This course introduces the students to the basic techniques of circuit analysis. Circuit elements and their volt-ampere relationship as phasors at steady-state. Circuit analysis techniques using nodes and meshes. Steady-state single phase and three-phase circuits. Single phase transformers. Introduction to DC and AC machines.

3- 2- 6

Credit(s): 1

GEE283A**Engineering Economics**

An introduction to the economic analysis of engineering and production activities: time-value of money; cash flows and equivalence; depreciation concepts and analysis; economic equipment replacement decisions; capital budgeting; effects of taxation and price level changes; cost-benefit analysis in the public sector.

2- 0- 4

Credit(s): 0.5

EEE203B**Electric Circuits I**

This course deals with the behavior of circuits built from basic linear circuit elements (resistance, capacitance, inductance, ideal operational amplifiers, and independent and dependent voltage and current sources); DC circuit analysis; energy storage and time domain behaviour; sinusoidal steady state circuit analysis; ac power; three-phase systems; and, ideal transformers and mutual inductance.

3- 2- 5

Credit(s): 1

EEE243B**Applied Computer programming**

The objective of this course is to introduce the design of software programs and components in an applied context. Topics include: design of software components as part of larger systems including other software components and other electrical and computer subsystems; effective decomposition of the software components of a system into modules, and modular programming and design techniques; structured programming, the execution model for software, the software build cycle, basic data structures, the use of third-party components and the use of underlying operating system support; rudimentary control of physical systems through high-level interfaces to digital I/O channels, and A/D

and D/A converters.

For students of the Second Year taking Electrical or Computer Engineering.

3- 2- 5

Credit(s): 1

EEE245A

Logic Design

Students completing this course will be able to analyze and design simple digital circuits. Review of number systems and introduction to digital codes. Basic combinational logic topics: Boolean Algebra, SSI logic gates, minimization techniques, and mixed logic theory. Detailed discussion of MSI logic functions: decoders, multiplexers, comparators and arithmetic logic units. Sequential logic and digital memory: latches, flip-flops and registers. Classical and Algorithmic State Machine design procedures for, and problems with synchronous, sequential machines. Introduction to hardware construction and computer aided simulation tools.

For students of the Second Year taking Electrical or Computer Engineering.

3- 2- 5

Credit(s): 1

3rd Year

EEE301A

Applied Electromagnetics

Students completing this course will be capable to apply the laws of electromagnetism to simple practical problems. It provides the basis for the program's microwave and antenna courses. Review of vector operations and coordinate systems; experimental basis for electromagnetic theory; electrostatics and magnetostatics. Laplace's and Poisson's equations; solutions to boundary-value problems. Maxwell's equations; wave equation and plane waves; transmission lines; shielding and hazards.

For students of the Third Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE303A

Electric Circuits II

At the end of this course, the student will be able to apply the laws of circuit analysis to practical electronics or power systems problems. Basic concepts of circuit theory; circuit analysis techniques; transient analysis of first and second order linear circuits; sinusoidal steady state analysis; transfer function and frequency response of networks and systems; application of Laplace transform to the solution of network and system equations; state variables, state equations.

For students of the Third Year taking Electrical Engineering or Computer Engineering.

3- 2- 5

Credit(s): 1

EEE307B**Computer Interfacing Techniques**

After completing this course, students will be capable to design simple interfaces to modern microcomputers. Topics include: description of bus; timing analysis; serial and parallel interfacing; polling and interrupts; counters and interval timers; A/D and D/A conversion; interfacing to magnetic devices; Direct Memory Access (DMA) techniques.

For students of the Third Year taking Computer or Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE309B**Control Systems I**

Students will know and understand the theoretical foundations of control systems. Techniques for the modelling of control system components, state variable models for linear systems, transfer functions, analysis of complete control systems; stability, root locus; performance criteria; design of single-input single-output linear feedback control systems via, state and output feedback, principles of sampled-data systems.

For students of the Third Year taking Electrical Engineering or Computer Engineering Software Stream.

3- 2- 5

Credit(s): 1

EEE311B**Signals and Systems**

At the end of this course, the student will be able to apply the basics of communications theory and the mathematical tools to simple analog and digital communications problems. Fourier analysis of signals, linear systems and filters, sampling theory, probability theory, random variables and random processes.

For students of the Third Year taking Electrical Engineering and Computer Engineering Hardware Option.

3- 2- 5

Credit(s): 1

EEE321B**Object-Oriented Techniques**

At the end of this course, the student will be able to apply the techniques of Object-Oriented Analysis (OOA) and Design (OOD). The course material covers managing complexity, using data and procedural abstraction, encapsulation, hierarchies, and decomposition of problems into classes and objects. The concepts of overloading, multiple inheritance and polymorphism are introduced. The analysis, design and implementation phases of software development are considered in the context of an iterative, use case driven object-oriented development methodology. Design patterns are introduced as context for higher-level reuse. Lecture material and course assignments will provide an introduction to the Unified Modelling Language (UML). Java will be used as an implementation language to illustrate object-oriented concepts.

For students of the Third Year taking Computer Engineering.

3- 2- 5

Credit(s): 1

EEE331A**Energy Conversion**

The objective of this course is to provide the student with a basic understanding of the operation of electromechanical devices and a realistic expectation of their performance. An introduction to energy conversion processes with emphasis on electromechanical devices. Topics include: a survey of energy-conversion methods, properties of magnetic materials and analysis of magnetic circuits; transformers; analysis of electromechanical systems; polyphase systems; performance of a.c. and d.c. electrical machines; introduction to power semiconductor circuits; modelling of physical systems.

For students of the Third Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE341B**Electronic Devices and Circuits**

For students of the Third Year taking Electrical or Computer Engineering. At the end of this course the student will be able to analyze and design simple electronic circuits. Description and operation of electronic components: diodes, bipolar and field effect transistors. Diode circuits and applications. Single stage amplifier: biasing, small signal models, configurations, analysis and design of amplifier circuits. Low frequency response of single stage amplifiers. Binary logic circuits.

3- 2- 5

Credit(s): 1

EEE351A**Computer Organization and Assembly Language**

The objective of this course is for the student to learn a modern assembly language and be able to program in that language. The microprocessor as a system building block; introduction to architecture.

Microcomputer buses, address decoding, memory devices, simple input/output. Introduction to programming: instruction sets, addressing modes, assembly and machine-language programming, interrupts and vectors. Interfacing with peripherals: parallel and serial interface adapters, interrupt requests and handshakes.

For students of the Third Year taking Electrical or Computer Engineering.

3- 2- 5

Credit(s): 1

EEE361A	Digital Design and HDL Modelling
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Students, after taking this course, will understand the process of designing digital systems and be able to use modern digital design tools to plan, develop and implement complex digital systems. Review of the analysis and design of synchronous sequential circuits: Moore networks, Mealy networks. Controller design using the Algorithmic State Machine approach (ASM): ASM chart notation; Standard methods for ASM implementation: multiplexer method, one-hot method, ROM method. Introduction to a hardware description language: VHDL. Presentation of the various VHDL constructs and their usage. Simulation of VHDL circuit descriptions. Register Transfer Logic (RTL): introduction of a simple language to describe register transfers; hardware implementation of RTL statements; Application to the design of a simple computer.

Microsequencers and microcontrollers. Implementation of control algorithms using microsequencers: modification to ASM charts, microprogramming. Review of modern microcontrollers. Introduction to programmable logic: description of PLAs, PALs, CPLDs, FPGAs. Introduction to software tools for design with programmable logic.

For Third Year students taking Computer Engineering.

3- 2- 5

Credit(s): 1

4th Year

EEE403A	Electronic Circuits
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Students are provided with an understanding of the principle of operations of analog circuits of medium complexity that are used as building blocks in larger circuits. High frequency small signal models of transistors; multistage amplifiers; cascade configuration. Non-ideal operational amplifier, use of negative feedback, effect of feedback on gain, input and output impedances, noise, distortion and parameter tolerances, applications. Positive feedback circuits: linear feedback oscillators, switching oscillators, multivibrators. Emitter coupled differential amplifier. Use of negative feedback with transistor amplifier. Current mirror, basic Opamp internal structure.

For students of the Fourth Year taking Electrical or Computer Engineering Hardware option.

3- 2- 5

Credit(s): 1

EEE411A**Communication Theory**

The aim of this course is to provide the student with knowledge and understanding of the basics of communication theory. Modulation techniques, sampling theorem; AM, FM, PCM, signal-to-noise ratio; Hilbert transforms; digital communications: ASK, FSK, PSK, DPSK, probability of errors; pulse shaping and timing.

For students of the Fourth Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE417A**Electromagnetic Propagation and Radiation**

Review of Maxwell's equations and boundary conditions. Waveguide structure models. Resonant cavities. Introduction to fibre-optics. Antenna theory for element and arrays. A study of earth propagation modes such as ground waves, space waves and ionospheric reflections.

For students of the Fourth Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE425B**Digital Control Systems**

Sampling, z-transforms and transfer functions; state-space representations; stability; root locus; compensator design; computer control of feedback systems.

An elective course for students of the Fourth Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE429A**Electric Machines and Power**

Review and extension of polyphase circuit theory and analysis. Symmetrical components. Power, energy, maximum demand, frequency and phase measurements. Characteristics of power transformers, a.c. and d.c. rotating machines, including two-machine systems. Electrical power generation and distribution. Survey of the economics of power systems. Methods of analysis of power transmission. Faults in interconnected systems.

An elective for students of the Fourth Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE431B**DSP Hardware**

Introduction to digital signal processing; sampling: Nyquist rate, sample and hold, D/A and A/D, delta modulation; digital signal processors; DSP hardware: multipliers and barrel shifters; hardware architectures; digital filters design and implementation: FIR and IIR; FFT algorithm and software implementations; multiprocessor systems. This course consists of lectures, demonstrations, exercises and laboratories.

EEE351A Computer Organization and Assembly Language, EEE461A Digital Communications or EEE411A Communication Theory.

For students of the Fourth Year taking Electrical Engineering and Computer Engineering Hardware option.

3- 2- 5

Credit(s): 1

EEE433B**Satellite and Mobile Communication**

Spread Spectrum Systems, Fundamentals of Satellite Communications, Fundamentals of Cellular Mobile Communications. Error correction codes.

An elective for students of the Fourth Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE435A**Principles of Operating Systems**

Introduction to the C language, concurrent processes, inter-process communication, deadlock, scheduling, input/output, file systems, file servers, memory management, virtual storage management.

For students of the Fourth Year taking Computer Engineering.

3- 2- 5

Credit(s): 1

EEE441B**Microwave Circuits, Devices and Systems**

Microwave circuit analysis using impedance and scattering-matrix representations. Microwave sources, amplifiers and solid state devices. Microwave passive devices; filters, couplers, etc.

Microwave integrated circuits (Microstrip) and CAD techniques. Microwaves receivers and transmitters. Overview of communication satellite systems with emphasis on RF components and link consideration. Introduction to radar basics, target cross-section, MTI and pulse doppler, weather radar, synthetic aperture radar and pulse compression techniques.

Prerequisite: EEE417A

An elective for students of the Fourth Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE447B

Robotics

Survey of sensors and transducers for measuring physical quantities; measurement errors and calibration of analog and digital interfaces; sampling, quantization; actuators. Implementation of representative microprocessor-based closed-loop systems selected from the areas of motor drives and robotics. Software implementation of robot control systems. Types of robot arms. Path control and obstacle avoidance methods. Single processor and multi-processor distributed systems.

Note 1: An elective for students of the Fourth Year taking Electrical Engineering.

Note 2: Also available as an elective for students of the Fourth Year taking Computer Engineering with the permission of the department.

3- 2- 5

Credit(s): 1

EEE449B

Power Electronics

Characteristics of power semiconductor devices. Switching circuits; rectifiers, voltage controllers, converters, inverters and cycloconverters. Polyphase circuits, harmonics and modulation. Applications to control of DC machine, synchronous and induction motors. Energy conversion.

Prerequisite: EEE331A

An elective for students of the Fourth Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE453A

Digital VLSI Design

IC technologies overview; MOS transistor: structure, operation, modelling; NMOS inverters: d.c. analysis and comparative analysis; CMOS inverter: d.c. and transient analysis, power dissipation; IC lithography and fabrication steps; layout and layout verification; Digital CMOS circuits: analysis and layout of combinational and sequential circuits; dynamic CMOS; I/O structures.

Note 1: For students of the Fourth Year taking Computer Engineering, Hardware option.

Note 2: An elective for students of the Fourth Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE455	Electrical Engineering Design Project
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The design project allows the student to demonstrate that he is capable of applying the skills and techniques he has learned in program courses to deliver a working product. Under the supervision of a faculty member, groups of 2-4 students design and construct a prototype system to satisfy selected criteria against which its actual performance is evaluated. Oral progress reports are required along with a written final report and formal examination by a board of staff members.

2 - 2 - 4 (Fall Term)

0 - 4 - 4 (Winter Term)

For students of the Fourth Year taking Electrical Engineering.

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Credit(s): 2

EEE457	Computer Engineering Design Project
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See EEE455. Emphasis will be placed on software specification, documentation and management techniques.

2 - 2 - 4 (Fall Term)

0 - 4 - 4 (Winter Term)

For students of the Fourth Year taking Computer Engineering.

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Credit(s): 2

EEE459A	Engineering Human-Computer Interaction
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Practical processes and techniques for the development of usable computer systems. Topics include: Foundations of usability. Users, user roles and context of use. Activity and task modeling. Abstract interface modeling. Interface navigation. Layout, visual communication, affordances and constraints. Supporting interface learning. Prototyping and prototype evaluation. Architectures and implementation techniques. Inspection and review methods. Usability metrics. Laboratory and field

testing.

For students of the Fourth Year taking Computer Engineering Software option.

3- 2- 5

Credit(s): 1

EEE461A	Digital Communications for Computer Engineers
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The aim of this course is to provide the student with knowledge and understanding of the basics of digital communication theory. Fourier series and transform; sampling, AM and FM modulation; analog and digital transmission of digital data; effects of noise and limited bandwidth on data transmission; transmission media characteristics; basic probability theory and coding theory.

For students of the Fourth Year taking Computer Engineering Hardware option.

3- 2- 5

Credit(s): 1

EEE466A	Distributed Applications
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Principles and characteristics of distributed systems, computer communication technologies and protocols, client/server systems, interprocess communication, distributed objects, time services and interprocess coordination, distributed transaction and replica which include concurrency control and two phases-commit-protocol, name services, security such as cryptographic key distribution, authentication and signature, web services, network-centric computing, and an overview of divers internet services and protocols (e.g. SMTP, NNTP, HTTP, FTP, Telnet, WWW, PPP).

Prerequisite: EEE321B

For students of the Fourth Year taking Computer Engineering Software option.

3- 2- 5

Credit(s): 1

EEE469A	Computer Organization
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A course to familiarize the student with some aspects of computer hardware. Topic include: computer design methodology, processor and control design, memory and system organization. Input/ Output.

For students of the Fourth Year taking Computer Engineering.

3- 2- 5

Credit(s): 1

EEE473B**Computer Communications**

Review of computer-communication techniques and networks; circuit and packet switching; network topology; queueing and its application to networks; capacity assignment; routing and flow control; multiple-access techniques; network protocols; security and cryptography.

Note 1: For students of the Fourth Year taking Computer Engineering.

Note 2: An elective course for students of the Fourth Year taking Electrical Engineering.

3- 2- 5

Credit(s): 1

EEE492A**Software Processes and Work Products**

Introduction to scale-related complexities inherent in software projects. Study of software development processes, and of work products associated with those processes. Specific topics include: Requirements Analysis, Software Metrics, Software Quality, Estimating Software Complexity, Estimating Software Projects, Testing & Inspection, and Software Project Management. Lectures may be supplemented with critical reading and discussion of published articles on software. The course is supported by a laboratory in which the students undertake a software development project.

For students of the Fourth Year taking Computer Engineering Software option.

3- 2- 5

Credit(s): 1

EEE495B**Digital Systems Architecture**

Hardware components and technologies; digital systems design methodology; ASIC design methodology; synchronous systems: static timing analysis, performance analysis, synchronization and synchronization failures; clocked static and dynamic circuits; asynchronous circuits; arithmetic algorithms: architectural trade-offs and silicon realization; regular array architectures: PLA architectures and PLA generation for ICs, MOS memory architectures: RAM, DRAM, ROM and CAM. Students will learn to design digital systems or components of digital systems including physical realization using CAE tools.

Prerequisites: EEE345A, EEE453

For students of the Fourth Year taking Computer Engineering Hardware option.

3- 2- 5

Credit(s): 1

EEE499B	Real-Time Embedded System Design
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Definition, structure, and properties of embedded real-time systems. Typical applications. Review of related concepts, including tasking models, context switching, interrupts, and the ADA rendez-vous. Specification and design methods for real-time systems and applicable CASE (Computer-Aided-Software- Engineering) tools. Specification and verification of timing. Scheduling and schedulability analysis. Real-time operating systems, kernels, and programming languages. Fault tolerance, critical races, deadlock and livelock. Host target development. Distributed systems.

For students of the Fourth Year taking Computer Engineering Software option.

3- 2- 5

Credit(s): 1

Mechanical Engineering

1st Year

GEE167B**Engineering Graphics I**

The course introduces the students to the use of engineering graphics in the engineering design process. Graphical communication and visualization are emphasized by both paper sketching and computer-aided methods. The student is introduced to computer-aided drafting and design techniques using SolidWorks 3D CAD software. Topics studied are sketching, applied geometry, solid modeling, multi-view and pictorial projection, sectional views, auxiliary views and dimensioning.

Note 1: GEE167B - For students of the First Year taking Engineering

Note 2: GEE265A - For students of the Second Year taking Engineering.(Last year that GEE265A will be offered)

1- 2- 3

Credit(s): 1

2nd Year

GEE265A**Engineering Graphics I**

The course introduces the students to the use of engineering graphics in the engineering design process. Graphical communication and visualization are emphasized by both paper sketching and computer-aided methods. The student is introduced to computer-aided drafting and design techniques using SolidWorks 3D CAD software. Topics studied are sketching, applied geometry, solid modeling, multi-view and pictorial projection, sectional views, auxiliary views and dimensioning.

Note 1: GEE265A; for students of the Second Year taking Engineering. (Last year that GEE265A will be offered)

Note 2: GEE167B; for students of the First Year taking Engineering.

1- 2- 3

Credit(s): 1

GEE267B**Engineering Graphics II**

This course continues the study of engineering graphics and its use in engineering design and production. Conventional drawing standards are covered. Topics studied are: sections and assembly drawings, threads and fasteners, fits and tolerance including geometric dimensioning and tolerance (GDT) methods, mapping and geographic information systems (GIS), structural drawing and welding, and working drawing packages. The use of SolidWorks is continued with emphasis on producing

conventional engineering drawings to CSA standards from solid models of simple assemblies.

Prerequisites: GEE265A, GEE167B

For students of the Second Year taking Mechanical and Civil Engineering.

1- 2- 3

Credit(s): 1

3rd Year

MEE301B

Machine Design

Previous work in mechanics, stress analysis, and metallurgy, as well as new knowledge regarding safety factors, stress concentration factors and fatigue, is applied to the practical design of machinery. The course is oriented towards the specific design of various machine elements such as shafts, welds, cables, bolts, bearings, gears, belt drives, brakes, etc.

Prerequisites: GEE231, MEE331, MEE33

For students of the Third Year taking Mechanical Engineering.

3- 1.5- 4.5

Credit(s): 1

MEE303B

Engineering Design

Approaches and procedures for handling closed and open-ended engineering problems. Solutions required are to define mechanical systems and their components and machine elements. The procedures include consideration of design specifications, properties of the system to be designed, candidate alternative solutions, manufacturing, standards, acceptance requirements and maintenance. Representative projects involving all stages from conception to drawings will be assigned.

Prerequisite(s): GEE265A, GEE267, MEE331A, MEE335A

For students of the Third Year taking Mechanical Engineering.

3- 1.5- 4.5

Credit(s): 1

MEE311B

Fluid Mechanics I

This course emphasizes the basic concepts of fluid dynamics. The course includes a study of the following: fluid properties; fluid statics, fundamental equations of fluid motion, control volume concept applied to the continuity, momentum, and energy equations, the Euler and Bernoulli equations; flow measuring devices; similitude and dimensional analysis; incompressible flow in closed conduits; introduction to the concepts of boundary layer, turbulence, velocity distribution in laminar and

turbulent flow; and hydraulic turbo machines.

The lectures are supplemented by problem assignments and by experiments conducted in the laboratory, including forces on submerged surfaces, velocity distribution in internal flows, and pumps.

Prerequisite(s): PHE103, MAE201 or MAE203

For students of the Third Year taking Mechanical Engineering.

3- 1.5- 4.5

Credit(s): 1

MEE315B

Fluid Mechanics

This course emphasizes the basic concepts of fluid dynamics. The course includes a study of the following: fluid properties; fluid statics, fundamental equations of fluid motion, control volume concept applied to the continuity, momentum, and energy equations, the Euler and Bernoulli equations; flow measuring devices; similitude and dimensional analysis; incompressible flow in closed conduits; introduction to the concepts of boundary layer, turbulence, velocity distribution in laminar and turbulent flow and open channel flow.

The lectures are supplemented by problem assignments and by experiments conducted in the laboratory, including forces on submerged surfaces, velocity distribution in internal flows, and weirs.

Prerequisite(s): PHE103, MAE201 or MAE203

For students of the Third Year taking Civil Engineering.

3- 2- 5

Credit(s): 1

MEE321B

Heat Engines Laboratory

A laboratory course illustrating the general principles, operating characteristics, and thermodynamic analysis of internal combustion engines, and steam and gas turbines.

This course is part of CCE321.

Prerequisites: CCE217, CCE311

For students of the Third Year taking Chemical and Materials Engineering.

0- 2- 2

Credit(s):

MEE331A

Strength of Materials

This intermediate course in strength of materials develops the relationships between stresses, strains,

deformations, and external loads for linear elastic bodies. Emphasis is given to the following topics: stress and strain at a point, the principle of superposition, combined stresses, Mohr's circle. Other topics include indeterminate structures, non-symmetric bending, non-homogeneous bars, shear flow in thin-webbed beams, etc.

Prerequisite: GEE231

For students of the Third Year taking Mechanical Engineering.

3- 1.5- 4.5

Credit(s): 1

MEE333A	Metallurgy and Engineering Materials
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This introductory course in materials science emphasizes the relationships between the structure and the properties of engineering materials, namely metals, plastics, ceramics, and composites. The effects of different strengthening mechanisms and thermal processing are studied. Failure mechanisms such as ductile and brittle fractures, fatigue, creep, and corrosion are covered. Emphasis is placed on properties and processing of metallic materials. The lectures are supplemented by tutorials, assignments on theory and applications, and laboratory experiments with cold working, heat-treating and metallography.

Prerequisite(s): CCE101, MAE101, MAE129, PHE103, GEE231

For students of the Third Year taking Mechanical Engineering.

3- 1.5- 4.5

Credit(s): 1

MEE335A	Introduction to Manufacturing Processes
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The object of this course is to familiarize the student with some tools of the mechanical engineer. A combination of lectures, demonstrations, and hands-on experience are used to teach the basis of fabrication techniques. Shop work includes measuring techniques, tolerances, machine tool theory and operation, welding and manufacturing processes.

Prerequisite: Successful completion of 2nd year in Mechanical Engineering

For students of the Third Year taking Mechanical Engineering.

1- 2- 3

Credit(s): 0.5

MEE345A	Applied Mechanics
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This course builds upon the foundations established in PHE103. The principles of kinetics and kinematics are expanded into three dimensions to review Newton's Second Law, Work and Energy, and Impulse and Momentum. Practical engineering applications are used as examples to illustrate the theory and as problem assignments. The course provides the necessary foundation for work in machine

design, systems dynamics and robotics.

Prerequisite(s): PHE103, MAE203

For students of the Third Year taking Mechanical Engineering.

3- 1.5- 4.5

Credit(s): 1

MEE351A**Thermodynamics I**

This course is a study of classical Thermodynamics by examining its application to practical devices such as engines and refrigeration systems. The First and Second Laws of Thermodynamics are studied in detail, and applied to gases and two phase mixtures used in the devices studied. The lectures are supplemented by problem assignments and experiments in the laboratory periods.

Prerequisite(s): MAE203, CCE217

For students of the Third Year taking Mechanical Engineering.

3- 1.5- 4.5

Credit(s): 1

MEE353B**Thermodynamics II**

This course continues the study of classical thermodynamics begun in MEE351A. Further applications in power producing devices and refrigeration systems, mixtures and solutions, and compressible flow are studied in detail. The course is oriented throughout towards practical applications such as power production and cogeneration, heating and air conditioning, humidification and dehumidification, introduction to gas dynamics, compressible flow in nozzles and diffusers, and normal shock waves. The lectures are supplemented by problem assignments and experiments in the laboratory periods.

Prerequisite(s): MEE351

For students of the Third Year taking Mechanical Engineering.

3- 1.5- 4.5

Credit(s): 1

MEE383B**Measurement Devices and Systems**

This course is designed to acquaint the student with modern sensors, instrumentation, and methods of data recording and analysis. Low-pass and high-pass systems of first- or second-order are considered. Transfer functions of devices and instruments are developed and their response to specific inputs are studied. Factors such as precision, hysteresis, response, offset, etc. are defined. Examples specific to the Canadian Forces are used whenever possible.

Prerequisite(s): MAE327

For students of the Third Year taking Mechanical Engineering.

3- 1.5- 4.5

Credit(s): 1

4th Year

MEE403A/B

Design of Engineering Systems

Approaches and attitudes in handling complex and novel engineering design problems, innovation, creativity, and entrepreneurship. Representative engineering problems are assigned to individuals or groups. The assigned problems vary widely in nature and extent. Solution processes require use of a variety of existing knowledge and engineering techniques from other courses, but also ingenuity and imagination. Design solutions must include consideration of requirements specifications, preliminary conceptual design, layout design, manufacturing plan, acceptance requirements and maintenance plan.

Prerequisite(s): GEE267, MEE301, MEE303, MEE331

An elective course for students of the Fourth Year taking Mechanical Engineering.

3- 1- 4

Credit(s): 1

MEE405A/B

Computer-Aided Design and Manufacturing for Mechanical Engineers

The aim of the course is to teach the principles of computeraided design and manufacturing. Topics covered include hardware configurations, three-dimensional modelling, an introduction to the finite element method, and computer-aided manufacturing. Students will gain hands-on experience with SolidWorks 3D CAD, CosmosWorks FEM and CamWorks softwares through classroom examples and assignments. A project will require the manufacturing of a machined part on a numerically controlled milling machine or turning centre.

Prerequisite(s): GEE267, MEE303, MEE331, MEE335

An elective course for students of the Fourth Year taking Mechanical Engineering.

2- 2- 4

Credit(s): 1

MEE411A

Fluid Mechanics II

This course extends the study of Fluid Dynamics initiated in MEE311B - Fluid Dynamics I. Material covered includes the following: advanced concepts in dimensional analysis and similitude, dynamics of inviscid flows, potential flow theory and circulation, vorticity, an introduction to the effects of viscosity and three-dimensional flows.

Prerequisite(s): MEE311, MAE327

For students of the Fourth Year taking Mechanical Engineering.

3- 2- 5

Credit(s): 1

MEE413B**Fluid Mechanics III**

In this course, the differential forms of the momentum and energy equations are developed and applied to incompressible viscous flows in canonical flow configurations. Topics include laminar and turbulent momentum and convection in thermal boundary layers, and flow over and forces encountered by immersed bodies. Much emphasis is placed on laboratory experimental work

Prerequisite(s): MEE411, MEE421

For students of the Fourth Year taking Mechanical Engineering.

3- 2- 5

Credit(s): 1

MEE421A**Heat Transfer**

This course presents fundamental concepts and mechanisms of heat transfer processes, including the roles of conduction, convection and radiation in the context of the conservation of energy. Steady-state conduction in one and two dimensions is undertaken using analytical numeric & graphical methods. Conduction in simple two and three-dimensional geometries is also explored. Internal and external heat transfer by forced convection is studied using dimensional analysis and experimental correlation. Basic analysis of heat transfer by radiation is carried out along with the design and analysis of heat exchanges.

The lectures are supplemented by problems and experimental laboratory periods, including the determination of the thermo-physical properties of substances and experimental convection heat transfer studies.

Prerequisite(s): MEE311 or MEE315, MEE351, MAE327

For students of the Fourth Year taking Mechanical Engineering.

3- 2- 5

Credit(s): 1

MEE431A**Stress Analysis**

This is an advanced course in stress analysis, covering various topics such as the theory of elasticity, rotating disks, thick-walled pressure vessels, non-circular bars in torsion, failure theories, energy methods, and composite materials.

Prerequisite(s): MEE331

For students of the Fourth Year taking Mechanical Engineering.

3- 2- 5

Credit(s): 1

MEE433A/B**Mechanical Behaviour of Advanced Materials**

This course continues the study of engineering materials to cover in depth plastics, ceramics, composites, and speciality alloys. The focus is on mechanical properties, uses, manufacturing and processing of these advanced materials.

The applications of these materials in engineering are also outlined. The effects of temperature, environment, failure mechanisms and prevention are covered. Mechanical behaviour under cyclic loading, fatigue, and fracture mechanics are presented.

The lectures are supplemented by laboratory experiments and demonstrations.

Prerequisite(s): MEE331, MEE333

An elective course for students of the Fourth Year taking Mechanical Engineering.

3- 1- 4

Credit(s): 1

MEE437A/B**Robot Dynamics and Control**

This course covers the following topics: Classification of robot manipulators, Homogeneous Transformations, Euler Angles, Denavit Hartenberg Convention, Forward and Inverse Kinematics. Manipulator Jacobians, Robot Dynamics, Design of joint actuating systems, Independent joint control, Point-To-Point control, Path planning and trajectory control, Sensory components for robot control, Space application of robotic systems.

Prerequisite(s): MEE345A, MEE383B

An elective course for students of the Fourth Year taking Mechanical Engineering.

3- 1- 4

Credit(s): 1

MEE443B**Feedback Control of Electro-mechanical Systems**

A first course in linear feedback control systems which logically follows MEE445A: Modelling and Simulation of Dynamic Systems. The material is covered under the following main topics: performance specification and preliminary design, stability criteria and techniques of feedback control. The examples and the problems used to illustrate the theory will concentrate on hydraulic and pneumatic systems as used on current military hardware.

MATLAB/SIMULINK is used extensively for the design of control systems and to carry out the simulations.

Prerequisite(s): MAE129, MAE203, MEE345, MEE383, MEE445

For students of the Fourth Year taking Mechanical Engineering.

3- 2- 5

Credit(s): 1

MEE445A**Modelling and Simulation of Dynamic Systems**

This course is a continuation of MEE345. Topics covered include: derivation and solution of equations of motion using Newtonian and methods, free and forced vibration of single and multiple degrees of freedom systems, time domain and frequency response of cascaded and coupled electro-mechanical systems. MATLAB/SIMULINK is used to simulate the dynamic response of these systems.

Prerequisite(s): MAE229, MAE327, MEE345

For students of the Fourth Year taking Mechanical Engineering.

3- 2- 5

Credit(s): 1

MEE451A**Combustion Engines**

After a review of basic thermodynamic and combustion principles necessary for studying the topics of interest, the lectures consider the design and operation of spark-ignition, Diesel, and gas turbine engines. Some of the topics studied are: fuel and ignition systems; supercharging, combustion chambers; properties and performance of fuels; sources and control of air pollution; alcohol, hydrogen, and other non-conventional fuels.

The lectures are supplemented by assignments and laboratory experiments.

Prerequisite(s): MEE353

An elective course for students of the Fourth Year taking Mechanical Engineering.

3- 1- 4

Credit(s): 1

MEE457A/B**Compressible Flow**

This course continues the study of compressible flow that was introduced in MEE353B - Thermodynamics II. The topics include flow in subsonic and supersonic nozzles and diffusers, supersonic wind tunnels, normal and oblique shock waves, oblique shock wave reflections, Prandtl Meyer Flow, flow in constant area ducts with friction, heating and cooling. The course emphasizes the application of the principles covered to practical engineering problems. The lectures are supplemented

by assigned problems, computer exercises, and laboratory experiments.

Prerequisite(s): MEE353, MEE411

An elective course for students of the Fourth Year taking Mechanical Engineering.

3- 1- 4

Credit(s): 1

MEE461A/B	Aeronautical and Space Propulsion
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Illustrations of the application of the fundamental principles of fluid mechanics and thermodynamics to the analysis of present-day and proposed propulsion systems. Topics covered include turbojets and ramjets and their associated components including compressors, combustors and turbines. Current developments in chemical and electrical rockets are discussed as related to space vehicle missions and requirements.

The lectures are supplemented by assigned exercises and laboratory problems in related areas.

Prerequisite(s): MEE353, MEE411

An elective course for students of the Fourth Year taking Mechanical Engineering.

3- 1- 4

Credit(s): 1

MEE465A/B	Tribology
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Among the topics considered are: surface topography, Hertzian contact stresses and deformation, friction and wear theories, lubricant properties and testing, hydrodynamic lubrication, solution of Reynolds equation, elasto-hydrodynamic lubrication, boundary lubrication, lubricity of aviation fuels, rolling contact bearing design, bearing dynamics and a selection of tribological solutions to real engineering problems.

Prerequisite(s): Successful completion of 3rd year

An elective course for students of the Fourth Year taking Mechanical Engineering.

3- 1- 4

Credit(s): 1

MEE467A/B	Aircraft Performance
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This course will introduce the students to the analysis and methods used in the evaluation of aircraft flight performance parameters from the aircraft design specifications. Topics covered will include the determination of flight ceiling, range and endurance, climbing and manoeuvring flight, take-off and landing parameters for turbine powered aircraft. Velocity hodographic presentations energy state

methods, aircraft level flight and manoeuvre envelopes and, finally, wind effects will be analyzed.

Prerequisite(s): MEE331A or MEE345A

An elective course for students of the Fourth Year taking Mechanical Engineering.

3- 1- 4

Credit(s): 1

MEE469A/B**Marine Systems Engineering**

The topics studied include: hull design for surface ships and submarines, including drag and stability; selection and performance of propulsion engines, including diesels, gas turbines and electric propulsion; propellers and water jet drives; generation and control of on-board electricity; weapon systems; and life support systems. The course is focused on the fundamental principles that drive the design of the systems studied, but also discusses recent technology and future developments.

Prerequisite(s): MEE311, MEE351

This course considers the main engineering issues involved in the design and operation of ships.

3- 1- 4

Credit(s): 1

MEE471**Engineering Project**

This course provides the student with the opportunity to undertake a project of sufficient magnitude to include all essential elements of an independent engineering study, under the supervision of a faculty member. Students are expected to perform a thorough literature survey on their selected topic, propose a plan of action, prepare a schedule for the major phases of the project, design and build the apparatus and the instrumentation as required, integrate theory taught in previous engineering courses and acquire the new knowledge required for the analytical portion of the project. Students submit three written reports to their project supervisor and make two oral presentations to classmates and faculty members during the course of the year.

0 - 3 - 3 (Fall Term)

0 - 4 - 4 (Winter Term)

Prerequisite(s): 8 Third Year Mechanical Engineering credits

For students of the Fourth Year taking Mechanical Engineering.

- -

Credit(s): 1.5

MEE483A/B**Reliability**

The course will introduce the students to basic reliability principles at the systems and sub-systems level as well as analysis methods and decision-making processes based on reliability data. Topics include: review of probability and statistics, the important functions in reliability, the identification of an item's failure distribution, the reliability of series, parallel and redundant systems.

The lectures are supplemented by assigned exercises and a project in a related area.

Prerequisite(s): MAE209

Note 1: This course is offered in French only.

Note 2: An elective course for students of the Fourth Year taking Mechanical Engineering.

3- 1- 4

Credit(s): 1

Athletics

Course Descriptions

PO 107

The first year program is aimed at giving officer-cadets the tools to take charge of their personal fitness. Courses in that program include: theory on exercise physiology, nutrition, training principles and injury prevention. The practical contents expose officer-cadets to the different training methods commonly used in the Canadian Forces. They are also required to complete the Basic Military Swim Standard test.

PO 207

The second year program offers a variety of elective sport courses where officer-cadets select one course per term for a total of three sports. The second year program concentrates its options on collective sports activities played within the Canadian Forces plus some other popular ones.

Among those sports, we have soccer, broomball, spinning, volleyball, basketball, squash, badminton, handball, water polo, flag football and, softball. Students also acquire basic knowledge related to organizing sports tournaments.

PO 307

The third year program is developed to expose all officer-cadets to military skills requiring physical fitness. These courses introduce activities such as various forms of unarmed combat, different obstacle courses, waterborne training as well as military rappelling.

PO 407

The fourth year program offers a variety of elective sport courses and follows the same principles as the second year program. It concentrates its options on individual sports and activities such as canoeing, rock climbing, Rappel Master course, advance weight training, swimming and life guarding, advanced unarmed combat, pressure points control tactics and spinning leadership.

Professional Military Training

Course Descriptions

General Military Knowledge

The PO covers general knowledge regarding Canadian Forces policies and regulations such as drugs and alcohol, harassment, counselling, duties and responsibilities, etc. This PO also covers RMC-specific knowledge such as College history, organization, Cadet Wing structure, etc.

Personal Attributes

Officers in the Canadian Forces must exhibit exemplary conduct and deportment at all times. Such conduct stems from well developed personal character traits such as honesty, integrity, loyalty, self respect, respect of others, responsibility, and courage. It includes the concept of "service before self," and the development of a work and play ethic to bring out the best in individuals and subordinates. These traits are developed and assessed throughout the 4yr programme.

Teamwork

Teamwork and cooperation are essential elements of a successful military unit. This PO provides practical opportunities for team building and fostering esprit-de-corps. It also develops the necessary confidence and trust in peers. The PO stresses the need to become a good follower and team player in order to become a good leader.

Leadership

The core element of officership is leadership. This PO provides practical opportunities to develop and practice leadership in a wide variety of scenarios. All opportunities for leadership, including Cadet Wing bar appointments, sports team captains, class leaders, class seniors, project and event organizers, etc. are exploited to expose OCdts to leadership challenges, and to assess their development and performance. The minimum requirement for successful completion of the programme is to perform satisfactorily as a Cadet Section Commander for one semester in either third or fourth year.

Communications

This PO is a follow-on to the material commenced during BOTP, and concentrates on the development of essential written and oral communication skills. These skills form a cornerstone of leadership and will be needed for all aspects of RMC life.

Drill

Drill is a powerful method to develop individual pride, mental alertness, precision, and esprit de corps which will assist OCdts to carry out orders instinctively and immediately at all times. The attainment of good discipline calls for a high development of personal qualities, particularly self-control and cooperation. Drill and formal parades are designed to develop these qualities so that their practice becomes habitual and will persist under the strain of activities in peace and war. This PO will teach OCdts foot, rifle, and sword drill, and will place OCdts in increasing levels of authority and responsibility on the parade square in order to further develop their self confidence and bearing.

Training Periods

PMT Training Periods

used to deliver the Military Component:

ACTIVITY	YEAR				COMMENTS
	1st	2nd	3rd	4th	
FALL SEMESTER					
Cadet Wing Start-of-Year Weekend	A	A	A	A	
Reunion Weekend	A	A	A	A	
Battle of Britain	D	D	D	D	
Remembrance Day	A	A	A	A	
Wing Sports Day (Fall)	A	A	A	A	
Christmas Ball	A	E	E	A	
WINTER SEMESTER					
Mess Dinner				A	1 per environment
Wing Sports Day	A	A	A	A	
West Point Weekend	A	A	A	A	
MOC Weekend	A	A	A		
Colour Party Competition			D		
Sandhurst Competition	D	D	D	D	
Sports Awards Ceremony	A	A	A	A	
Copper Sunday/Battle of Atlantic Wknd	A	A	A	A	
Graduation Weekend	A	A	A	A	

Legend:

A All

E Elective/Optional

D Designated

S If/When Scheduled

Division of Continuing Studies

Officers of Administration

Dean

M.F. Bardon, rmc, BEng, MEng (RMC), PhD (Calgary), PEng

Vice-Dean

P. Constantineau, BA, MA (Montréal), PhD (Heidelberg)

Director of Curriculum and Programme Coordinator

T. Decechi, BEng, MBA, PhD

Continuing Studies Coordinator at Campus Fort St-Jean

B. Mongeau, BScA, MScA, DScA (École Polytechnique), PEng

General Information

Mandate

The mandate of the Division of Continuing Studies is to make university education available to all members of the CF, spouses of Regular Force members and DND civilian employees. From a small pilot project begun in 1996, the Division has undergone very rapid growth as demand for new programme and course offerings has exponentially increased.

The addition of Professional Military Education (OPME) (in January 2002) added substantially to the number of students, and to the variety of locations within Canada and abroad where courses are now offered. In addition to the traditional method of classroom delivery, some courses are now offered packaged in a paper-based correspondence style, and by electronic learning either via the Internet or on CD-ROM.

Our policies recognise CF and other professional training for credit towards undergraduate or advanced degrees. We also offer a growing number of unique degree programmes, specially tailored for CF members, such as the Bachelor of Military Arts & Science, the Master of Defence Management and Policy, and the Master of Arts in War Studies. These programmes provide an opportunity to combine professional career training with university courses, and offer the flexibility to undertake such challenging study at times and in formats suited to the circumstances created by life in the CF.

Continuing Studies at RMC

The degree programmes offered through the Division of Continuing Studies at RMC are thoroughly grounded in the elements of the military profession, permitting students to acquire a university degree regardless of where they live and work, and minimising any negative impact on their commitments to family and career. The programme integrates in-service training and experience with special and standard university courses. Courses are offered in English and French and students may complete assignments, essays and exams in the official language of their choice.

Mission

The mission of the Division of Continuing Studies is to provide lifelong learning opportunities to all members of the Canadian Forces (Regular and Reserve), spouses of Regular Force members, and full-

time civilian employees of DND.

Overall, the Division of Continuing Studies has four main roles:

1. to identify and analyse the needs of continuing education
2. to direct the development and availability of distance learning courses in co-operation with the departments
3. to assist in the integration of new technologies and methodologies for distance learning educational systems
4. to manage, jointly with the departments, the progress of all candidates in their studies and to contribute to their supervision

Programme Principles

The Royal Military College of Canada is an academic institution that understands the operational commitments of CF members. The degree programmes are designed with flexibility in mind and emphasize maximum efficiency and minimum time for completion, through application of the following principles:

Accessibility:

- Attendance on College grounds is not required
- Many courses are offered in both official languages
- Many courses are offered at the student's location, using the most appropriate distance learning mode

Accreditation:

- Full transferability of appropriate university credits obtained elsewhere
- Full or partial credits as appropriate for in-service training
- Accreditation for "Top-up" modules (a "Top-up" course is a course designed to take into account previous military training)
- Credit(s) for second language proficiency

Flexibility:

- Timetables accommodate interruptions due to operational commitments
- No rigid time limit is imposed for completion of a degree programme

Relevance:

- In-service related courses can make up a significant part of the content for some programmes
- Standard courses will be taught, where possible, within the defence context
- New courses specific to the defence context and unique to these programmes are designed and offered

Modes of Delivery

Continuing Studies courses are offered in two modes:

1. Classroom mode:

Courses are offered at a number of bases across Canada by instructors selected by the appropriate RMC academic Modes of Delivery department and under the guidance of that department. The courses are chosen to meet requirements of Continuing Studies degree programmes.

2. Distance learning mode:

Distance learning courses are offered to students who wish to take courses for which there is insufficient demand to justify a classroom course, who are in isolated locations, or who cannot commit to classroom courses due to military requirements or family commitments.

Other Programmes

In addition to part-time studies, the Division provides administrative support to some full-time studies degree programmes. Part-time studies can be a lead-in to these programmes.

1) Initial Baccalaureate Degree Programme (IBDP)

Education is an essential and integral part of officer professional development and the CF encourages officers to pursue continuing education on their own volition. The CF has established a goal to have all officers hold a university degree, with the exception of those commissioned from the ranks. In support of this goal, the CF has established a programme to provide subsidized education to eligible officers in pursuit of their initial baccalaureate degree.

DAOD 5031-7 outlines the conditions and benefits associated with this programme. It does not preclude other initiatives that have been put in place in support of continuing education.

2) University Training Plan - Non-commissioned Members (UTPNM)

The UTPNM Programme is a DND-sponsored subsidization plan open to certain non-commissioned members of the CF who meet the academic requirements for admission to RMC or other Canadian universities as candidates for a baccalaureate degree. Depending on their level of academic standing, UTPNM candidates may enter either at the first-year level or with an advanced standing. Except for certain allowances made for age, service experience, and marital status, these officer cadets must meet substantially the same academic and military requirements as those in the Regular Officer Training Plan.

The conditions governing eligibility, application, and selection procedures are set forth in CFAO 9-13, and as modified by subsequent orders.

Continuing Studies Committee

The Continuing Studies Committee, a committee of Faculty Board with representation from each academic department, acts as a steering committee for the administration of all continuing education activities and is responsible for the academic governance of the non-resident undergraduate programmes. The Continuing Studies Committee makes recommendations to Faculty Board concerning the development and approval of Undergraduate Programmes offered through the Division of Continuing Studies and the accreditation of courses offered by other organisations.

The membership of the Continuing Studies Committee, chaired by the Director of Curriculum, consists of

- a representative from each academic department

- the Registrar
- the Chair of the Syllabus Committee or delegate
- the Director of Course Development,
- the Director of Course Delivery and
- the Director of Prior Learning Assessment and Recognition

On behalf of Faculty Board, the Committee adjudicates the registration and Programme of Study for Continuing Studies students, acts as a marks committee for Continuing Studies courses, prepares and maintains the Continuing Studies Calendar, and schedules regular meetings thrice annually, holding special meetings as required.

Admission & Registration

Admission And Registration (Undergraduate Studies)

Except for Visiting and Interest Only Students, individuals must first be admitted into a Programme of Study in order to register in a course offered through the Division of Continuing Studies. However, since the processing of admission applications may take months, students filing their first application for admission into a programme of study offered through the Division of Continuing Studies may also fill out and send in their [Course Registration Form](#). While their application for admission is being processed and until they are formally admitted into a programme of study, students have the status of Interest Only Students. Interest Only Students need not meet all the criteria for admission into a programme of study, but must nonetheless meet the prerequisites for registration in the individual courses in which they wish to register.

For more information on the Academic Regulations and the criteria for admission into the programmes of study offered through the Division of Continuing Studies, please consult RMC's website: http://www.rmc.ca/academic/registrar/programme/index_e.htm.

Admission Qualifications

Individuals interested in admission into a programme must meet certain qualifications. The specific eligibility requirements for the Undergraduate Programmes of Study offered through the Division of Continuing Studies are outlined below.

The Continuing Studies Undergraduate Programme is open to all

- MOC qualified members of the Canadian Forces, including members of the Reserve Forces
- Members who aren't yet MOC qualified, but who apply with the recommendation of the unit's Formation Commander
- full-time civilian employees of DND
- spouses of Regular Force members

who have completed senior matriculation or equivalent, or who meet the conditions for admission as a mature student.

Applications from mature students 23 years of age or older on the date of registration will be considered on their individual merit. Mature students applying must submit a letter describing their background, experience, and educational goals.

Admission Procedure

Individuals who wish to be considered for admission into an Undergraduate Programme of Study must complete and submit an [Undergraduate Studies Application](#) - along with supporting documentation - to

DCS for approval.

The following documents must be included with the Application:

- If a Regular Force member, a Military Personnel Record Resume (MPRR) (formerly CF 490A)
- If Reserve Force member, a CF 1007 Record of Service
- If a spouse of a Regular Force member, a copy of your spouse's Military Personnel Record Resume (MPRR) (formerly CF 490A)
- Official transcripts of all college, CEGEP, or university courses completed
- For students interested in registering in a university programme other than the BMASc, official secondary-school transcripts
- A one-page summary of your academic background
- Payment of the administrative fee for the processing of an application for admission

The [Undergraduate Studies Application](#) can be found in the [Annex](#) section of the DCS calendar. Mail or Fax the completed application to DCS.

Note: Individuals only need to be admitted into a programme once.

Prior Learning Assessments

Students applying for admission into a Programme of Study who have completed programmes or courses at other universities or community colleges, or professional training courses taken either within the CF or through some other organization (whether in Canada or abroad), may seek to have their prior learning at a university level recognized by RMC. The following section describes how applicants for admission into a programme of study offered through the Division of Continuing Studies may seek and obtain advanced standing in their chosen programme of study at RMC.

Request for Transfer Credits

Applicants for admission into a Programme of Study who have completed programmes or courses at other universities or community colleges, whether in Canada or abroad, and who wish to have this form of their prior learning recognized and counted towards the degree or certificate they are seeking at RMC should complete and send, along with their [Undergraduate Studies Application](#), a Request for Transfer Credits .

For their Request for Transfer Credits to be considered, applicants must include

- Official transcripts from the post-secondary institutions, whether universities or colleges, at which they have completed programmes or courses
- Payment of the administrative fee for the assessment by RMC of their prior learning at a university level

The assessment by RMC of a request for transfer credits takes weeks, and in some cases several months, especially if the documentation on the courses for which transfer credits are sought is hard to come by. In order to accelerate the processing of their request, applicants are invited to provide along with their application and official transcripts, whenever possible, an official description and/or an outline of the courses they have taken and for which they are seeking transfer credits.

It should be noted that current Undergraduate Academic Regulations at RMC do not allow the granting of transfer credits for courses in which a grade of less than C- or 60% has been achieved, unless there is a Memorandum of Understanding between RMC and a university or a consortium of universities or

colleges to which RMC is a party.

Once the assessment is completed, students will receive a summary sheet explaining what credits have been awarded and what credits are required to complete the chosen programme of study. As of 1 June, 2004, RMC has been authorized to levy an administrative fee for the posting of transfer credits on the student's transcript. Thus, the summary sheet sent to the student may in future also include a statement regarding the posting fee for the awarded transfer credits. Students of RMC who are members of the CF may be entitled to a reimbursement of some or all of the administrative fees RMC has been authorized to levy. See [Academic Reimbursement](#).

Assessment and Recognition of Professional Training

The Faculty Council of RMC, on the recommendation of a department, the Continuing Studies Committee and the Faculty Board of RMC, may also approve university credits based on

- Military training and qualifications, whether obtained within Canada or abroad, recognized as learning at a university level
- Some other professional training course or programme given by an organization other than a post-secondary institution
- Special university-level courses designed to augment and "Top-up" military training and experience

Presently, only students who are admitted or apply to be admitted into a BMASc programme may apply for and be awarded credits for professional training. To apply, the student must fill out a Request for Assessment and Recognition of Professional Training form and send it to DCS. Before filling out and sending this form, applicants to the BMASc should consult the [BMASc Table of Equivalencies](#) found in the [Annex](#) to view the list of military training courses RMC has already assessed and awarded undergraduate credit.

Along with the completed Request for Assessment and Recognition of Professional Training, the application must include the following:

- If a Regular Force member, a Military Personnel Record Resume (MPRR) (formerly CF 490A)
- If a Reserve Force member, a CF 1007 Record of Service
- Payment of the administrative fee for a preliminary assessment of the application, which is non-refundable, and payment for the Prior Learning assessment itself at the Canadian or International Students rate, as applicable. ([Refer to fee table](#))

If the student is requesting the assessment and recognition of a professional training course that has not been taken with the CF, the application must include a certificate or some proof that the course was completed successfully as well as the documentation of the course such as the training plan or the course manual (or a photocopy thereof).

Once the assessment is completed, students will receive a summary sheet explaining what credits have been awarded and what credits are required to complete the chosen programme of study. As of 1 June, 2004, RMC has been authorized to levy an administrative fee for the posting of PLAR credits on the student's transcript. Thus, the summary sheet sent to the student may in future also include a statement regarding the posting fee for the awarded PLAR credits. To find out when the payment of these fees will be required, how they should be paid and how they can be reimbursed, please consult the DCS website at <http://www.rmc.ca/academic/continuing/>.

Students of RMC who are members of the CF may be entitled to a reimbursement of the administrative

fees RMC has been authorized to levy, in whole or in part. See [Academic Reimbursement](#).

CFMSP (OPME) Assessments

CFMSP (OPME) assessments are performed by the Prior Learning Assessment and Recognition (PLAR) Section. Appropriate university and college courses and military training are considered for military equivalencies in the OPME programme. Requests for military equivalency must be directed in writing to the PLAR Section and must include

- a copy of appropriate transcripts and course outlines (if available)
- student number from the credit-granting institution
- a copy of Member Personnel Record Resume (MPRR)
- maiden name (if applicable)
- current mailing address

CMC graduates must submit both their college number and MPRR. Transcripts and course outlines are not required.

Please note: Military equivalencies granted in the OPME programme result in military credit toward the completion of the OPME programme. They are not academic equivalencies and do not result in academic credit at RMC.

The PLAR Section of RMC can be reached at the following address:

PLAR
Division of Continuing Studies
Royal Military College of Canada
PO Box 17000, Station Forces
Kingston, ON
K7K7B4

Email: plar@rmc.ca

Course Registration and Fees

All courses offered through the Division of Continuing Studies have limited enrolment and all registrations require approval from the Division of Continuing Studies.

To register for a course, individuals must complete a course registration form and pay a registration fee. There is a separate form and fee structure for undergraduate courses and for the CFMSP(OPME) Programme.

Students admitted to the undergraduate programme register for courses using the [Course Registration and Payment Form - Undergraduate](#). Tuition rates for the current academic year are detailed on the registration form.

Individuals admitted to CFMSP(OPME) register for CFMSP(OPME) courses using the [Course Registration Form - OPME](#). If the successful completion of the OPME programme is a career requirement for them, eligible officers need not pay for registration fees nor for course packages. However, the payment of fees may be required as of April 1, 2004 in the case of withdrawal from a course that is due neither to illness nor to a deployment. For more information on OPME Course Registrations, please visit the OPME website at <http://www.opme.forces.gc.ca/>.

The necessary course registration forms can be found in the Annex section of the DCS calendar or on the RMC website. Mail or fax the completed form to the Division of Continuing Studies. The fax number for DCS is on the form.

Notes

1. Course registrations are not accepted over the phone.
2. It is not recommended that a student register in a senior-level course prior to successfully completing some junior-level courses.

Fees and Payments

DCS undergraduate course registrations are not processed without payment. Payments can be made by

- cheque
- money order
- credit card (MasterCard or Visa only)

Cheques and money orders should be made payable to "Receiver General for Canada." Credit card payments should include the card number and the expiry date.

Academic Reimbursement

Canadian Force members will receive a tuition income tax receipt at the end of the fiscal year. Military members should consult DAOD 5031-3 for academic reimbursement procedures or consult their local Base/Wing/Camp Education Officer or Personnel Selection Officer.

Academic Programmes

Undergraduate Programmes

Bachelor of Military Arts and Science (BMASc)

The BMASc is a unique degree programme for the CF, is thoroughly grounded in the elements of the military profession, and integrates in-service training with special and standard university courses. It is designed for the serving military member, and recognizes university-level achievement appropriate to the profession of arms.

Though equivalent to a conventional three-year degree in terms of quality and quantity of instruction, the BMASc degree is designed to be earned over an extended period, integrating professional training and academic study.

The BMASc degree is designed around a compulsory core, which includes credits for the university-level courses that are part of the Officer Professional Military Education (OPME) Programme that was launched in January 2002. The compulsory core for the BMASc programme includes the following 10 credits:

- BAE101 - Management: Principles and Practices in a Canadian Defence Setting, or BAE100 - Principles of Management in a Defence Setting
- HIE208 - Canadian Military History: A Study of War and Military History, 1867 to the Present, or another course in Military History, such as HIE205 - Canadian Military History: New France to 1870

- POE206 - The Canadian Forces and Modern Society: Civics, Politics and International Relations, or POE205 - Canadian Civics and Society, or POE316 - Introduction to International Relations
- PSE402 - Leadership and Ethics
- HIE475 - Technology, Society, and Warfare
- Two credits in English Grammar and Literature
- One more credit in Military Psychology and Leadership (PSE123 - Fundamentals of Human Psychology, or its equivalent)
- Two credits in Science (Mathematics, Physics, Chemistry or Computer Science)

At least 15 of the minimum 30 required course credits must have military content, as determined by the Continuing Studies Committee, and at least 10 of the course credits must be taken through RMC. An appropriate number (at least 10) must be at the senior level (third or fourth-year, or 300 or 400-level courses), and among these at least 5 must be earned through RMC.

For the purpose of the BMASc degree, a credit with military content is defined as one in which the learning is directly related to a military topic. There are several ways in which a credit is considered to contain military credit:

- the student has completed a course in which the main focus is clearly of a military nature (e.g., CCE304 - Military Chemistry, or HIE371 - War and the Military Profession)
- the student has taken a general course but directed his/her personal research to areas of a military nature (ex: the student is taking a course on the rise of modern Germany but in which papers are focused on military aspects, such as "German Defensive Innovations on the Eastern Front, 1943-44"). In these cases, students are required to submit proof of their research (i.e., a copy of the relevant papers) before any military content credits are granted
- the student has completed an academic course which the Continuing Studies Committee deems to be directly relevant to the serving member's military career; and military training courses and proficiency that have been approved by the Continuing Studies Committee for academic credit

[RMC/DCS Courses Meeting the Military Course Content Requirements of the BMASc](#)

[BMASc Table of Equivalencies](#)

[BMASc Assessment / Summary Sheet](#)

Please note that those who have registered in the BMASc Programme prior to 1 Sept 2004 have the option of completing their studies following an earlier description of the core credits or the new one, which integrates the university-level courses of OPME or their equivalent.

Bachelor of Military Arts and Science Honours (BMASc Hons)

Though equivalent to a conventional four-year Honours degree in terms of quality and quantity of instruction, the BMASc (Hons) degree is designed to be earned over an extended period, integrating professional training and academic study. This 42-credit Honours degree with a specialization in Military Studies is designed for students registered in the BMASc Programme who intend to pursue graduate studies after completion of their Bachelor's degree. The students who will have completed the Honours Programme will have met one important requirement for admission into a Graduate Studies Programme.

Those interested in registering in the BMASc Honours Programme are required to file an application with the Division of Continuing Studies once they have earned at least 20 university credits and maintained an average of not less than B- in their university courses. The application should also include

a topic for the Directed Research Project (DRP - see below).

The BMASc (Hons) Programme has the same 10-credit core curriculum as the General Programme (see 2.1 above), plus a Directed Research Project (MAS400), which counts for two credits, for a total of 12 compulsory credits.

At least 20 of the minimum 42 required course credits must have military content, as determined by the Continuing Studies Committee, and at least 20 (i.e., 18 one-term credits, plus 2 for the DRP) of the course credits must be taken through RMC. An appropriate number (at least 20) must be at the senior level (third or fourth-year, or 300 or 400-level courses). To ensure honours standing, students must achieve at least a B in the Directed Research Project (MAS400) and maintain at a minimum a B average in senior-level courses and at least a B- average in 400-level courses.

Examination and Acceptance of the Directed Research Project (MAS400)

Examination and Acceptance of the Directed Research Project (MAS400)

The Directed Research Project is seen as a major component of the BMASc (Hons) degree in that it affords the student the opportunity to demonstrate his or her ability to critically analyse some element of his or her military experience. Students are required to submit a proposal to the Division of Continuing Studies, along with their application to be admitted into the programme. Upon acceptance of the proposal, a supervisor will be assigned and the work will be carried out under the guidance of that individual. If appropriate, this project may take the form of a technical project or a directed reading course with one or two major essays. Directed Readings allow students to explore subjects of particular interest through the execution of a series of assignments, while under the supervision of a university professor.

The proposal (1-3 pages) must identify a general area of interest (e.g., twentieth-century Canadian Naval Strategy). Specifically, it must provide the following information:

- why the area is of military interest
- why the student is interested in the topic
- the overall objective of the project
- what issues the student would like to discuss
- whether or not the research materials are expected to be readily available (i.e., is the material classified)
- any extraordinary sources that might be required to carry out the work
- a preliminary bibliography (approximately 20 titles)
- the name of an advisor in the local area of the student (if applicable)

During the review period, the Division of Continuing Studies, in consultation with the appropriate department head, will approve or reject the proposal. If approved, an appropriate supervisor will be selected for the student (or the suggested supervisor will be appointed).

The supervisor will then, in consultation with the student, determine the specific aim of the research and direct the student's efforts towards the completion of a major research paper (generally at least 50 pages) or two or more smaller research papers (between 20 and 25 pages each). These papers must have a definite military content and represent significant individual research and critical analysis. All papers must be submitted according to an essay format deemed acceptable by the supervisor (e.g., The Chicago Manual of Style, or The Modern Language Association).

The student and the supervisor will work out a timetable for the various parts of the work and for final

submission. Two copies must be submitted to the Division of Continuing Studies for final approval of the Directed Research Project credits. The paper(s) will be submitted to a second reader and the second reader, in conjunction with the supervisor, will determine the grade. The Directed Research Project must earn at least B to be counted as 2 credits towards the BMASc Honours degree.

The DRP is awarded 2 senior credits and should be likened to an Honours thesis, which is normally completed within 2 consecutive terms. But because most DRPs are produced at a distance, there are some delays to be expected due to this circumstance. Thus, a 12-month due date is set for the final draft of the DRP, starting from the date the project has a supervisor and has been approved. An extension beyond this 12-month due date may only be granted by the Dean, the Vice Dean or the Director of Curriculum, Division of Continuing Studies, and only due to exceptional circumstances, such as illness or deployment, can be evidenced.

Bachelor of Arts (BA)

The Faculty of Arts offers, through the auspices of the Division of Continuing Studies, a 3-year General BA. This degree is not open to ROTP / RETP cadets. At least 30 credits must be completed. Of the 30 credits, at least 20 must be in Arts, at least 15 must be RMC credits, and at least 10 of the 20 credits in Arts must be at the senior level.

Interested students have the option of applying to a General BA programme without a chosen concentration, or to a General BA with a minor (8 credits) or with a concentration (12 credits) that will be indicated on the transcript. In the later case, at least 12 credits must be in the chosen discipline (Business Administration, History, Psychology, English, French, Political Science or Economics); of those, at least 6 must be at the senior level; as well, at least 6 of the 12 credits in the chosen concentration must be earned through RMC.

The BA Programme with a concentration, offered through the Division of Continuing Studies, incorporates, in much the same manner as the BMASc, a compulsory core. Of the 30 credits required, the following 11 credits are mandatory:

- BAE101 - Management: Principles and Practices in a Canadian Defence Setting, or BAE100 - Principles of Management in a Defence Setting
- HIE208 - Canadian Military History: A Study of War and Military History, 1867 to the Present, or another course in Military History, such as HIE205 - Canadian Military History: New France to 1870
- POE206 - The Canadian Forces and Modern Society: Civics, Politics and International Relations, or POE205 - Canadian Civics and Society, or POE316 - Introduction to International Relations
- PSE402 - Leadership and Ethics
- HIE475 - Technology, Society and Warfare
- At least two credits in English Grammar and Literature
- At least one credit in Canadian History
- At least one more credit in Military Psychology and Leadership (PSE123 - Fundamentals of Human Psychology, or its equivalent)
- At least two credits in Mathematics, Computer Science, Chemistry or Physics

The BA Programme without a concentration, offered through the Division of Continuing Studies, includes the same 11 core credits as those listed above for the BA Programme with a chosen concentration, offered through the Division of Continuing Studies, to which, however, the following credit must be added:

- ECE103 - Elements of Microeconomics, or ECE104 - Elements of Macroeconomics

The total number of mandatory credits in the BA Programme without a concentration, offered through the Division of Continuing Studies, is therefore 12.

The General Bachelor of Arts programme without a concentration is offered to students who are interested in Arts courses, but initially have no particular interest in a specific field of study in Arts. The student who has chosen this programme will always have the option later in the course of his/her studies to register in the General Arts programme with a concentration.

The General Bachelor of Arts programme with a concentration is offered to students who already have an interest in a given field of study in Arts. The concentrations in Arts have been designed by the departments in the Faculty of Arts in such a way as to make it easy for a student who has completed the programme with distinction to upgrade his/her degree to an Honours degree with a view to pursuing studies at the graduate level.

Note that course offerings for the BA are limited at this time and completion of a degree may require attendance at RMC or the completion of some courses at other universities.

Please note that those who have registered in the BA Programme offered through DCS prior to 1 Sept 2004 have the option of completing their studies following an earlier description of the degree and of its core credits or the new one, which integrates the new description and the university-level OPME courses or their equivalent.

Bachelor of Science (BSc)

The Faculty Science offers, through the Division of Continuing Studies, a General BSc degree in a chosen minor in Science (Chemistry, Physics, Mathematics or Computer Science), indicated on the transcript, or without a minor. At least 30 credits must be completed. Of the 30 credits, at least 20 must be in Science, and at least 10 must be earned through RMC.

Of the 20 credits in Science, 9 are either those of the First Year General Programme of RMC (listed below) or equivalent.

Of the remaining 11 credits, at least 8 must meet the requirements of a minor as defined by the relevant Department or by the Faculty of Science (listed in the RMC Undergraduate Calendar), if the student has opted to register in the General BSc programme with a minor.

The student who has opted for the General BSc programme without a minor may take any Science course that counts towards a Science degree, provided the prerequisites for the courses are met and the 9 following credits of the First Year General Programme or equivalent are completed:

- MAE101 - Introduction to Calculus (2 credits)
- MAE129A - Introduction to Algebra (1 credit)
- CSE101 - Introduction to Algorithms and Computing (1 credit)
- PHE131 - Mechanics, 133 - Optics, and 135 - Experimental Physics, or PHE103 - General Physics (2.5 credits)
- CCE101 - Engineering Chemistry (2.5 credits)

The General Bachelor of Science programme without a concentration is offered to students who have a general interest in science courses, but who initially have no particular interest in a specific field of study in Science. The student who has chosen this programme will always have the option later in the

course of his/her studies to register in the General Science programme with a minor concentration, or in any other university programme requiring basic science courses.

The General Bachelor of Science programme with a minor is offered to students who already have an interest in a given field of study in Science. The minor concentrations in Science have been designed by the departments in the Faculty of Science in such a way as to make it possible for a student who has completed the programme with distinction to upgrade the degree to an Honours degree with a view to pursuing studies at the graduate level.

The General BSc Degree Programme, offered through the Division of Continuing Studies, incorporates, in much the same manner as the BMASc, a required core curriculum.

Of the 30 credits required, the following 8 credits are mandatory:

- BAE101 - Management: Principles and Practices in a Canadian Defence Setting, or BAE100 - Principles of Management in a Defence Setting
- HIE208 - Canadian Military History: A Study of War and Military History, 1867 to the Present, or another course in Military History, such as HIE205 - Canadian Military History: New France to 1870
- POE206 - The Canadian Forces and Modern Society: Civics, Politics and International Relations, or POE205 - Canadian Civics and Society, or POE316 - Introduction to International Relations
- PSE402 - Leadership and Ethics
- HIE475 - Technology, Society and Warfare
- Two credits in English Grammar and Literature
- One more credit in Military Psychology and Leadership (PSE123 - Fundamentals of Human Psychology, or its equivalent)

Note that course offerings for the BSc are limited at this time and completion of a degree may require attendance at RMC or the completion of some courses at other universities.

Please note that those who have registered in the BSc Programme offered through DCS prior to 1 Sept 2004 have the option of completing their studies following an earlier description of the degree and of its core credits or the new one, which integrates the new description and the four university-level courses of OPME or their equivalent.

Minor

A minor in the Faculties of Science and Arts consists of 8 credits or their equivalent as specified by departmental regulations. Students admitted into the BSc, BA or the BMASc Honours programmes may undertake a minor in the Faculty of Science or in the Faculty of Arts with the permission of the appropriate Dean.

Please consult the relevant departmental sections within the RMC Undergraduate Calendar for the specific requirements of a minor.

Students admitted into the BMASc General programme may not apply for the recognition of a minor course of study to be indicated on their transcript.

Certificate Programmes

Management with Applications to Defence

This Certificate is intended to allow individuals to gain a basic understanding of the defence management field. The topics include Principles of Management, Quantitative Methods, Marketing,

Information Systems, Financial and Management Accounting, Decision Making, and Fundamentals of Human Psychology. In addition, the Certificate can be applied to the three-year Continuing Studies General BA and BMASc degrees.

The equivalent of 10 one-term courses is required for completion of the Certificate.

Core courses (9 one-term courses):

- BAE101 - Management: Principles and Practices in a Canadian Defence Setting, or BAE100 - Principles of Management in a Defence Setting
- BAE216 - Marketing Fundamentals
- BAE220 - Introduction to Information Technology and BAE240 - Human Resource Management in a Defence Setting
- BAE244 - Quantitative Methods Applied to Defence Management
- BAE246 - Financial Accounting with Applications to Defence
- BAE266 - Management Decision-making in Defence
- BAE304 - Management Accounting
- PSE123 - Fundamentals of Human Psychology, or PSE228 - Group Dynamics

Electives (1 of the following one-term courses):

- BAE316 - Marketing Management
- PSE301 - Organizational Behaviour and Leadership

Environmental Protection

Every task and activity within the Department of National Defence/Canadian Forces interacts with the environment. Personnel see environmental issues and expertise as an important component of their role with the Department.

This programme will contribute to the achievement of the "DND Sustainable Development Strategy" by providing personnel with the skills, techniques, and knowledge they need to prevent pollution and conserve our environment. This programme offers students a Certificate in a field of interest to DND, as well as to government and private-sector employers. In addition, the Certificate can be applied to the three-year Continuing Studies General BA and BMASc degrees.

The equivalent of 9 one-term courses is required for completion of the Certificate.

Core courses (6 one-term courses + Directed Research Project):

- CCE285 - Introduction to Environmental Impact Assessment
- CCE289 - Impact of Science and Technology on the Environment
- CCE304 - Military Chemistry (can be substituted by a recent university-level organic chemistry course)
- CCE306 - Hazardous Materials Management (prerequisite: CCE304, or a recent university-level organic chemistry course)
- CCE386 - Introduction to Environmental Management Systems
- CCE485 - Waste Treatment Processes
- MAS400 - Directed Research Project on current environmental issues (two-term course equivalent)

Electives (1 one-term course):

- an Arts or Science course related to the environment
- PHE108 - Introduction to Oceanography

Graduate Studies Programmes

Graduate Studies Programmes

For information on Graduate Studies programmes offered through the Division of Continuing Studies, please refer to the Graduate Studies and Research Division Calendar found here: [http:](http://www.rmc.ca/academic/grad/calendar/index_e.html)

[//www.rmc.ca/academic/grad/calendar/index_e.html](http://www.rmc.ca/academic/grad/calendar/index_e.html)

- Master of Arts in War Studies
- Master of Arts in Defence Management and Policy

OPME

Officer Professional Military Education

This section of the Calendar is designed to give students participating in the Canadian Forces Military Studies Programme (Officer Professional Military Education [CFMSP (OPME)]) an overview of the programme. Students are strongly encouraged to contact the Counsellor Section if they have any questions pertaining to the programme. It should be noted that the university-level course component of this programme has been integrated into the BMASc programme, and also into the other two undergraduate programmes (BA & BSc) offered through DCS.

Background

References:

- A. CANFORGEN 082/00 ADM (HR-Mil) 041900Z Jul 00
- B. CANFORGEN 092/01 ADM (HR-Mil) 221200Z Aug 01

Effective September 2000, the 6 Officer Professional Development Programme (OPDP) courses were replaced by 5 CF Military Studies Programme (CFMSP [OPME]) courses for Developmental Period Two (O-DP2). This was announced through reference A.

The CFMSP (OPME) outlined at reference A was developed by the RMC Division of Continuing Studies (RMC/DCS) to deliver the DP2 Officer General Specification (OGS) Knowledge Component of the Officer Professional Development System (OPDS).

MND direction and subsequent evolution of the Enhanced Leadership Model (ELM) project has led to a combined DP1/DP2 Programme that reduces the workload on the junior officer, eliminates duplication, and provides just-in-time learning. Officer Professional Military Education (OPME) as announced at reference B replaces O-DP2.

The CFMSP (OPME) is intended to orient the junior officer to select topics within a common body of knowledge related to the military profession. From this body of knowledge, officers will begin to enhance their critical thinking skills and develop innovative responses to a myriad of issues. This is supported by a collaborative learning culture that begins the life-long appreciation for professional military development.

Concept of Delivery

The courses are classified as either Professional-level or University-level and incorporate the body of professional knowledge in subject areas identified at the DP1 and DP2 levels. The Professional-level courses are DCE/DEF001 - Introduction to Defence Management and DCE/DEF002 - Introduction to Military Law; the remaining four courses, HIE/HIF208 - Canadian Military History, POE/POF206 - The Canadian Forces and Modern Society: Civics, Politics and International Relations, HIE/HIF475 - Technology, Society and Warfare, and PSE/PSF402 - Leadership and Ethics are at the University level.

A Professional-level course is based on a depth of knowledge required of a professional officer, and students can expect to allocate 5-7 hours per week to studying.

A University-level course is based on a depth of knowledge commensurate with undergraduate instruction and is designed to provoke independent thought and to enhance an officer's base for decision-making. Such courses are either junior level (equivalent to a first or second-year university course) or senior level (equivalent to a third or fourth-year university course), and students can expect to allocate 9-12 hours per week to studying.

Please note that OPME courses have been developed in a modular format. A module covers a portion or subset of the course content and normally includes at least one assignment. The number of modules varies depending on the course. Students are expected to complete the modules in a specific sequence. Completion of a module occurs when the student successfully completes the assignment. This format develops flexibility within the programme to account for the Operational Tempo of units and personnel.

OPME Eligibility

- Regular Force Officers who have completed CFMSP (O-DP2) by July 2001 will be qualified DP1 & DP2 OPME.
- Regular Force Officers who have not successfully completed one or more CFMSP (O-DP2) courses by 1 July 2001 must complete all OPME courses satisfactorily to meet the new Officer General Specifications (OGS) DP1 & DP2 OPME requirement.
- Personnel who have successfully completed one or more CFMSP (O-DP2) courses by 1 July 2001 must complete a total of five distinct O-DP2 or OPME courses for DP2 OPME qualification, to include Leadership and Ethics. For example, a student who has completed only CFMSP O-DP2) A. Defence Organization and Establishments, must now complete four (4) OPME courses, including Leadership and Ethics, to finish the programme.
- After September 2003, the CFMSP (OPME) portion of DP2 is a requirement for promotion to Maj/LCdr in the Regular Force and for attendance at CF Command and Staff Course.

Students admitted into a programme offered through DCS - who are neither officers nor members of the CF - may register in OPME university-level courses (or their equivalents) to meet core requirements of their academic programme. It should be noted that the educational objectives of the OPME professional-level courses are met, in whole or in part, through RMC undergraduate courses: for instance, BAE101 - Management: Principles and Practices in a Canadian Defence Setting covers at a university level the subject matter taught in both modules of DCE001 - Introduction to Defence Management; POE488 - The Law of Armed Conflict covers at a university level the subject matter taught in Module 2 of DCE002 - Introduction to Military Law. It should also be noted that some graduate courses and seminars offered by RMC present another path toward OPME certification. For more information on these alternate paths toward OPME certification, please consult the DCS website or the PLAR Section within DCS.

Military Certification and University Credit

Professional-level OPME courses are considered passed (for military credit) when the student gets a

passing grade in both modules.

University-level courses are considered passed (for military credit) when:

- a. all the required assignments or elements of evaluation have been handed in; and
- b. the cumulative mark for the whole course is over 50%. Thus, a student may fail one or more modules, yet pass the course, provided the student handed in all assignments.

So long as an assignment or any other element of evaluation is missing, the course is not considered to have been completed, and hence is not passed.

Students who have received PLAR credit for some modules must successfully complete (achieve a mark over 50% in) all the remaining modules to be considered as having passed the course for military credit. Students who have received PLAR credit for some modules, but who wish to receive a university credit for an OPME University-level course, must complete all the modules.

Academic Regulations

Definitions

Definitions

Academic Year: For full-time students, the period from September to May. The academic year is divided into two terms, Fall Term and Winter term. For the purposes of determining academic standing the Summer term is not normally considered to make up the academic year.

Audit: Courses that are taken without the purpose of earning academic credit. A student must formally register to audit a course at the beginning of the term, subject to the permission of the instructor and the Department Head and will not normally be allowed to change to regular course status after registration deadlines have passed. The level of participation of auditing students will be determined by the instructor and will not normally include submission of assignments or writing exams. Audited courses will be annotated by the code "AU" on the transcript.

Challenge Examination: An examination to test the knowledge of candidates in the subject matter of a particular course, the purpose of which is to establish a basis for the granting of credit for the course, without the normal requirements for attending the course and completing the usual course requirements. Course credits earned through successful passing of a Challenge Examination will be annotated as "CG" (Credit Granted) on the transcript.

Concentration: A field of study within a Programme of Study. A concentration will be either Major or Minor depending on the number of courses completed in the field of study.

Core Curriculum of RMC: Courses RMC students are required to take in order to prepare them to take on positions of leadership within the Canadian Forces.

Course: A unit of study designated by a code and number in the Calendar.

Course Grade: The grade assigned on completion of the course, based on assignments, practical work, examinations and/or other course requirements as determined by the course instructor.

Credit: The equivalent, for all academic programmes, of a course consisting of about 39 hours of

lectures, normally delivered in one term.

Credit Granted: Credit granted based on challenge exams, non-university courses or other types of experience which is assessed as duplicating RMC academic requirements. Credits granted on this basis are annotated on the transcript with the code "CG".

Elective: A course belonging to another concentration a student may take to complete the minimum requirements of a Programme of Study.

Exemption: Granted when a student is not required to complete a Mandatory course within a Programme of Study because of prior exposure to related material. An exemption does not earn academic credit, but will enable the student to replace the exempted course with another elective course in order to earn sufficient credits to satisfy degree requirements. The transcript is marked with the code "EXE".

Extra course: A course which exceeds the requirements of the Programme of Study and which is taken only with the special permission of the Dean responsible for the programme in which the student is registered. The grades obtained in Extra Courses are counted in the student's term and cumulative averages, and when the Extra Course is within the field of study or concentration, the grade obtained in that course is taken into account with respect to the award of distinctions.

Failure of a Course: A student is deemed to have failed a course if the student fails the normal requirements for a course and either does not successfully pass the supplemental examination for that course, is not permitted or chooses not to write the supplemental examination.

Full Time Undergraduate Students: Those students registered in at least 80% of the credits of the full year programme for their Programme of Study once the deadline for course withdrawals has expired. Except for First Year, a full time student may, with the permission of the responsible department head, enrol in a maximum of one credit per term over the normal course load for the Programme of Study. Students wishing to enrol in more than one extra credit per term beyond the normal programme must first obtain permission of the responsible Dean. Minimum and maximum credits for full time status are presented in Table D-1.

Interest Only Students: Students who enrol in courses without being admitted into a Programme of Study at RMC or another university. Normally "Interest Only" students may enrol in a maximum of three credits in a given term, and may not complete more than a total of six credits before being required to seek admission into a Programme of Study.

Mandatory Course: A specific course which a student must pass, or otherwise receive credit, in order to complete a Programme of Study.

Optional Courses: Courses within a concentration that are not Mandatory Courses.

Part-Time Undergraduate Students: Students who are registered in less than 80% of the credits of the full year programme for their Programme of Study. A Part-Time Student may take a maximum course load of 3 credits in any one term and must complete at least one course every two years to remain registered in a Programme of Study.

Pass: A student is deemed to have passed a course if the student completes all requirements for that course to the satisfaction of the instructor.

Programme of Study: The minimum set of courses required for the completion of a particular degree or certificate.

Second Language Credits: Students achieving the bilingual standard (BBB) on official language tests will be awarded an unallocated junior credit with a mark of 90 percent. For comprehension, writing, and speaking, students will be awarded an additional credit with a mark of 90% for each score indicating fluency or better (C or E). A maximum of four such credits will be awarded for a student's second official language. A further two credits may be awarded on the same basis for other languages, subject to formal testing, for a maximum of 6 second language credits. All BBB and above credits will normally be allocated to the third year in a four year *full-time* program. Credits achieved in fourth year will be applied to that year. Credits granted on this basis are annotated on the transcript with the code 'SL'.

Supplemental Examination: An examination or other form of academic evaluation taken by students who have not passed a course, in order to receive credit for the course.

Term Average: The student's weighted average calculated at the end of any academic term based on all courses completed in that term plus the marks of all full-year courses which are in progress at that point.

Transfer Credits: Credits for work done at an accredited post-secondary institution, transfer credits may be granted for university courses that are assessed as satisfying RMC academic requirements, or as fulfilling the requirements for unallocated credits, provided that marks of C- or higher have been earned and an overall satisfactory academic record has been maintained. The minimum mark of C- is to be waived in cases where RMC has entered into a Memorandum of Understanding with another university or a consortium of universities requiring the parties to reciprocally recognize the passing grade in each other's courses, under conditions stipulated in the Memorandum. A transfer credit for a university-level course taken at a Community College or CEGEP may also be granted provided the mark is satisfactory; normally a maximum of ten such credits may be granted at an appropriate level, depending on the program of study. Course requirements that have been satisfied through Transfer Credit are annotated on the transcript with the code TC.

Visiting Students: Students enrolled in a degree programme at another university who are authorized by their home university to take courses at RMC. Except where a formal exchange agreement exists, a Visiting Student must provide a letter of permission from the home university in order to be approved for registration in an RMC course.

1. Degrees

Table D-1

Minimum And Maximum Course Loads For Full-Time Status

Programme	Minimum number of credits	Normal Course Load	Maximum number of credits
Arts: 1st Year	4 per term/ 10 per academic year	6 credits per term/ 12 per academic year	7 per term
Arts (except Business Administration): 2nd, 3rd or 4th Year	3 per term/ 8 per academic year	5 credits per term/ 10 per academic year	6 per term
Business Administration: 2nd, 3rd or 4th Year	3 per term/ 8 per academic year	Variable across Years	1 per term above the normal programme
Science/Engineering: 1st Year	4 per term/ 10 per academic year	6 credits per term/ 12.5 per academic year	7 per term

Science: 2nd, 3rd or 4th Year	3 per term/ 8 per academic year	5 credits per term/ 10 per academic year	6 per term
Engineering: 2nd 3rd or 4th Year	5 per term/ 10 per academic year	Variable across programmes and Years-	1 per term above the normal programme
BMASc: all Years	3 per term/ 8 per academic year	5 credits per term/ 10 per academic year	6 per term

1. Degrees

1.1 A degree of Bachelor of Arts (Honours), Bachelor of Arts (Concentration) or a Bachelor of Arts, Bachelor of Science (Honours), Bachelor of Science (Concentration) or a Bachelor of Science, a Bachelor of Engineering, a Bachelor of Military Arts and Science (Honours) or a Bachelor of Military Arts and Science, as appropriate, shall be granted by the Royal Military College of Canada to a student who has successfully completed the requirements of the College. The requirements for each of these degrees are specified in the appropriate sections and tables of the Undergraduate Calendar of RMC.

1.2 A degree of Master of Arts (MA), Master of Science (MSc), Master of Applied Science (MASc), Master of Engineering (MEng), Master of Applied Military Science (MAMSc), Master of Business Administration (MBA), Master of Defence Studies (MDS) or Doctor of Philosophy (PhD) shall be granted by the Royal Military College of Canada to those who successfully complete the requirements of the College. The requirements for each of these degrees are specified in the appropriate sections of the Postgraduate Calendar of RMC.

1.3 The degree Doctor of Laws (LLD) honoris causa, Doctor of Science (DSc) honoris causa, Doctor of Military Science (DScMil) honoris causa, or Doctor of Engineering (DEng) honoris causa may be granted by the Royal Military College of Canada to those who are worthy of the honour.

1.4 The Senate may, for cause stated, deny a degree for any student.

2. Certificates and Diplomas

2. Certificates and Diplomas

2.1 Certificates and diplomas are granted to students who have successfully completed the Programme of Studies leading to Certificates or Diplomas as specified in the appropriate Calendars and Brochures published by RMC.

3. Honours Programmes of Study

3. Honours Programmes of Study

3.1 To earn an Honours Bachelor of Arts degree within a discipline, a student must successfully complete the required courses set out in the applicable Honours Programme of Study, with at least 20 credits within the discipline, must maintain a minimum B average in the Honours courses in all 300 and 400 level courses in their Honours Programme of Study, and must attain at least a B- average in the 400 level courses.

3.2 To earn an Honours Bachelor of Science degree within a discipline, a student must successfully complete the required courses set out in the applicable Honours Programme of Study and must maintain a minimum B- average in all 300 and 400 level courses prescribed by the Faculty of Science.

3.3 To earn a Bachelor of Engineering degree within an approved engineering programme, a student must successfully complete all required courses set out within the applicable Programme of Study as prescribed by the Faculty of Engineering.

3.4 To earn an Honours Bachelor of Military Arts and Science degree, a student must successfully

complete the required courses set out in the applicable Honours Programme of Study, with at least 20 credits in Military Studies, must maintain a minimum B average in the Honours courses in all 300 and 400 level courses in their Honours Programme of Study, must attain at least a B- average in the 400 level courses and must achieve at least a B in the Directed Research Project (MAS 400).

3.5 The Faculty Council may, for cause stated, remove a student from an Honours Programme of Study in Arts or Science at any time, even though the student may have obtained the standard required by these regulations

4. Second Degrees

4. Second Degrees

4.1 The holder of an Undergraduate Degree from RMC or from another university may complete a second Undergraduate Degree at RMC, subject to the agreement of the Faculty and/or departments involved and to the following restrictions:

- a. The holder of an Honours degree from RMC or from another university may not apply to obtain from RMC a general degree in the same concentration;
- b. the student may not apply to register into a Programme of Study leading to a degree which has the same name as the first undergraduate degree he/she has obtained, except that the student may apply to be admitted to an Honours Programme of Study, if the first degree obtained is a general degree;
- c. the student has met the requirements for admission into the chosen Programme of Study, as determined by the Faculty and/or departments concerned.

4.2 To obtain a Second Degree, the holder of a first undergraduate degree, whether from RMC or from another university, must complete at least half of the credits required by the chosen Programme of Study through RMC and meet all the requirements of the chosen Programme of Study as specified in the RMC Undergraduate Calendar.

5. Upgraded Degrees

5. Upgraded Degree

5.1 The holder of a General Degree from RMC may apply to complete an Honours Programme at RMC, subject to the agreement of the Faculties and/or departments involved, if she/he has met the requirements for admission into the chosen Programme of Study, as determined by the Faculties and/or departments concerned.

5.2 To obtain an Upgraded Degree, the holder of a General Degree from RMC must meet all the requirements of the chosen Honours Programme of Study as specified in the RMC Undergraduate Calendar.

6. Changes in the Programme of Study

6. Changes In The Programme Of Study

6.1 In the case of a transfer of registration in a Programme of Study between Faculties, the approval of the Dean and the Head of the Department or Programme Co-ordinator to which the student requests transfer is required.

6.2 The courses selected by any student may not be altered later than four weeks (28 days) after the beginning of the academic year or, in the case of single term courses, four weeks after the beginning of that term without the permission of the Dean of the Faculty in which the student is registered.

6.3 Normally a student will not be permitted to withdraw from a course after the 7th week (49th day) of

the term. Courses dropped between the 4th and 7th week will be reflected as "Withdrawn/Abandonné" on the transcript, whereas after this period a mark will be assigned. In exceptional circumstances, the Dean may authorize a student to withdraw from a course at any time without academic penalty reflected on the transcript.

7. Course Completion

7. Course Completion

7.1 A university degree certifies that its holder has attained a measurable level of academic achievement as established by a recognized system of evaluation. Thus the performance of each student in each course must be evaluated by the instructor or instructors responsible for the course. Final grades are determined by students' performance on one or more of the following:

- a. Assigned work: assignments, term papers, projects, oral presentations etc;
- b. Class participation which, in certain disciplines, may justify an attendance requirement;
- c. Progress tests;
- d. Laboratory tests and/or laboratory work;
- e. Mid-term and/or final examinations; and/or
- f. Level of written and/or oral expression.

7.2 The weight accorded to the various elements is at the discretion of the instructor or instructors responsible for the course. At the beginning of a course the instructor shall provide students with the evaluation scheme in writing. The grading scheme cannot be altered without appropriate notice and normally should not be altered at all after seven weeks (49 days) into the term.

7.3 For courses offered at a distance (correspondence or internet) through the Division of Continuing Studies, the elements to be used in determining the final grade and the weightings of these elements will be decided by the department from which the course emanates. Normally, a proctored examination will be required.

7.4 For each course a student must complete term work and all assignments to the satisfaction of the department concerned.

7.5 Students must normally complete all required course work prior to the last day of the term in which the course is offered. Students with incomplete work will normally receive a final grade based on work completed. Under exceptional circumstances, the Department Head may allow an incomplete grade to be assigned followed by the code "IN", provided that the student requests an incomplete grade and the instructor agrees to accept the outstanding work. (Prior to granting such a request, the Department Head may require a written appeal and/or medical certification or other documentation that demonstrates extenuating circumstances.) When the Department Head agrees to allow an incomplete grade to be awarded, the student will be advised in writing of the last acceptable date for receipt of late work.

7.6 If a revised mark has not been submitted before the end of the following term, the "IN" annotation will be automatically deleted from the transcript and the interim mark will stand as the final mark. (This one-term maximum may be extended when failure to complete course requirements is clearly due to exceptional circumstances (i.e., not simply workload demands). However, when it is unlikely that a student will be able to complete a course due to Canadian Forces operational requirements, the student is encouraged to apply to withdraw without penalty.)

8. Transcript Notations

8. Transcript Notations

8.1 In addition to numeric and letter grades, the Royal Military College of Canada uses the entries

shown in Table 8-1 on the student's Transcript to reflect course status:

Table 8-1 Transcript Notations

Transcript Notation	Meaning
AC	Accepted (refers to thesis or project)
AE	Aegrotat credit
AU	Audit
CG	Credit Granted
CN	No Credit
EX	Extra Course (in excess of normal degree requirements)
EXE	Exempt (no credit given)
IN	Incomplete
IP	In Progress
TC	Transfer Credit
WD	Withdrawn
WDS	Withdrawn (due to military service)

9. Credits

9. Credits

Each course has been assigned a credit value, which is included in the Calendar description. Credits are used in determining the average and academic standing of a student. The actual credits assigned to a course are function of the contact time.

10. Final Examination

10. Final Examination

10.1 Final examinations will be held at dates and times specified in the examination timetables. Final examinations may be held outside the specified exam period only with prior approval of Faculty Council.

10.2 The instructor may refuse a student permission to write a final examination in a course if the requirements with regard to course work have not been met.

10.3 Under exceptional circumstances, including illness or deployment, a student may be granted, by the instructor or the Department Head concerned, permission to reschedule a final examination.

10.4 Final Standing is granted by the Senate upon recommendation from the Faculty Board and Faculty Council.

11. Academic Grades

11. Academic Grades

11.1 Grades for all courses appear on transcripts as letter grades and per cent grades.

11.2 Gradation of Academic Distinctions used by the Royal Military College of Canada is shown in Table 11-1.

Table 11-1 Conversion Table of Academic Standing

	Letter Grade	Percentage Grade Relationship
First Class Distinction	A+	94-100
	A	87-93
	A-	80-86
Distinction	B+	76-79
	B	73-75
	B-	70-72
Pass	C+	66-69
	C	63-65
	C-	60-62
	D+	56-59
	D	53-55
	D-	50-52
Failure	E	40-49
Serious Failure	F	0-39

12. Academic Distinctions

12. Academic Distinctions

12.1 Students graduating with a Bachelor of Arts (Honours) who have attained at least an A- average in the 300 and 400 level honours courses will have their transcripts annotated "First Class Distinction".

Students graduating with a Bachelor of Arts Honours who have attained at least a B- average in the 300 and 400 level honours courses will have their transcripts annotated "with Distinction".

12.2 Students graduating with a Bachelor of Science (Honours) who have attained at least an A- average in the 300 and 400 level honours courses will have their transcripts annotated "First Class Distinction".

Students graduating with a Bachelor of Science Honours who have attained at least a B- average in the 300 and 400 level honours courses will have their transcripts annotated "with Distinction".

12.3 Students graduating with a Bachelor of Engineering who have attained at least an A- average in all 400 level courses will have their transcripts annotated "First Class Distinction". Students graduating with a Bachelor of Engineering who have attained at least a B- average for all 400 level courses will have their transcripts annotated "with Distinction".

12.4 Students graduating with a Bachelor of Military Arts and Science (Honours) who have attained at least an A- average in the 300 and 400 level honours courses and achieved at least a B in their Directed Research Project will have their transcripts annotated "First Class Distinction". Students graduating with a Bachelor of Military Arts and Science (Honours) who have attained at least a B- average in the 300 and 400 level honours courses and achieved at least a B in their Directed Research Project will have their transcripts annotated "with Distinction".

12.5 For all other undergraduate degrees, students who have attained at least an A- average for all their 300 and 400 level RMC courses, based on a minimum of five courses, will have their transcripts annotated "First Class Distinction". Students who have attained at least a B- average in the 300 and 400 level RMC courses, based on a minimum of five courses, will have their transcripts annotated "with Distinction".

13. Aegrotat Standing

13. Aegrotat Standing

13.1 Aegrotat Standing in a course may be granted by the Faculty Council to a student who has been unable to write the final examination, but who has received satisfactory term marks. Courses passed

with an Aegrotat Standing will be so annotated in the transcript and not be included in the calculation of overall average.

14. Pass Standing

14. Pass Standing

14.1 A student is on Pass Standing unless the student is placed on Warning, Probation or is required to Withdraw

15. Warning

15. Warning

15.1 A Full Time student shall be placed on Warning if at the end of any term:

- a. The student fails one or more courses resulting in a total of less than 2 failed credits; and
- b. The student's term average is greater than 50 percent.

15.2 A Full Time student will be removed from Warning if the student passes all completed courses taken in the subsequent two academic terms.

15.3 A Part Time student shall be placed on Warning if, after taking courses in any given Programme of Study, the student has failed courses totalling more than four credits.

15.4 A Part Time student must pass all subsequent courses taken totalling no less than 8 credits to be removed from Warning.

16. Probation

16. Probation

16.1 A Full Time student shall be placed on Probation if:

- a. The student fails a course while on Warning; or
- b. The term average is less than 50 per cent but greater than or equal to 45 percent; or
- c. The student fails courses whose total credit value is greater than or equal to 2 but less than or equal to 4; or
- d. The student fails one or more Supplemental Examinations.

16.2 A student will be removed from Probation if all courses taken in the subsequent two terms are passed and if the student's cumulative average is equal to or greater than 50 percent.

16.3 A part time student shall be placed on Probation if:

- a. The student was on Warning and fails any mandatory course; or
- b. The student's cumulative average is less than 50 per cent but equal to or greater than 45 percent; or
- c. The student has failed courses totalling more than eight credits.

16.4 A Part Time student must pass all subsequent courses taken totalling no less than 8 credits to be removed from Probation.

17. Withdrawal

17. Withdrawal

17.1 Except when exceptional or extenuating circumstances are present, a Full Time student will be

required to Withdraw from a Programme of Study if:

- a. A Mandatory Course is failed for a second time; or
- b. The term average is less than 45 per cent; or
- c. The student fails Mandatory Courses totalling more than 4 credits in any term; or
- d. The student has failed courses totalling more than eight credits.

17.2 Except when exceptional or extenuating circumstances are present, a Part Time student will be required to Withdraw from a Programme of Study if:

- a. The student on Probation fails a course that the student has previously failed; or
- b. The student on Probation has a cumulative average of less than 45 per cent; or
- c. The student has failed courses totalling more than twelve credits.

17.3 A student who is required to Withdraw from a Programme of Study may apply for admittance to a different Programme of Study. Permission of the appropriate Dean is required for admittance to a new Programme of Study.

17.4 The Senate of the Royal Military College of Canada may at any time require a student to withdraw from the University if his or her conduct, attendance, work or progress is deemed unsatisfactory.

18. Re-admittance

18. Re-admittance

18.1 A student who has been required to Withdraw from a Programme of Study may apply to be re-admitted to the Programme of study no sooner than 12 months after receipt of the notification requiring withdrawal.

18.2 A student who is re-admitted to and is subsequently required to Withdraw from a Programme of Study for a second time will not normally be permitted to apply for re-admittance.

19. Supplemental Examinations

19. Supplemental Examinations

19.1 Supplemental Examinations at the Royal Military College of Canada will be held at dates and times specified in the Supplemental Examination timetables.

19.2 Both the original mark and the mark for any supplemental examinations will be shown on the student's transcript.

19.3 Unless precluded by Faculty Council, a Full Time student will be granted the option of writing Supplemental Examinations, provided that:

- a. the student's mark in the course is less than 50% but greater than or equal to 40%; and
- b. the student's overall Term Average is not less than 50%.

19.4 A Full Time student will not be permitted to write more than two Supplemental Examinations in any term.

19.5 No full-time student will be allowed to write more than four Supplemental Examinations during the student's entire period of undergraduate study at the Royal Military College of Canada.

19.6 Part-time students are not permitted to write Supplemental Examinations.

20. Language Used in Examinations and Course Work

20. Language Used in Examinations and Course Work

20.1 A student may write examinations in either English or French, except that the examinations in language courses must be written in the language concerned.

20.2 With the exception of language courses, a student may write assignments or other course work in the student's first official language. However, the student must inform the instructor of the student's intention of handing in assignments and other course work written in the official language different from the one in which the course is given no later than seven days after the beginning of the term. If the instructor is unable to mark course work written in that language, the instructor must immediately inform the department responsible for the course of the student's request. The department shall make arrangements for the course work written in that language to be properly marked.

21. Complaints, Grievances, Appeals and Re-reads of Examinations

21. Complaints, Grievances, Appeals and Re-reads of Examinations

21.1 A student with a complaint or issue that is academic in nature should first communicate the concern to the involved instructor in an informal manner. This should be done as soon as possible after the student first becomes aware of the issue. The student must ensure that the instructor is aware of all of the facts that the student believes have a bearing on the issue, and which could affect the instructor's reconsideration of the issue, but which may not have been considered in the instructor's initial decision. The instructor will examine the issue again, reconsider the decision on the basis of the information that the student has provided, and will provide a response to the student as quickly as is practicable, and normally within 7 calendar days.

21.2 If the student is not satisfied with the instructor's decision, the student should take up the issue with the chair of the department or programme of study concerned in an informal manner. The student must ensure that the chair of the department or programme of study is made aware of all the relevant facts having a bearing on the issue. The chair of the department or of the programme of study concerned must provide a response to the student as quickly as is practicable, and normally within 7 calendar days.

21.3 If the student is not satisfied with the decision, a formal Appeal may be made to the Dean of the division responsible for the programme. This Appeal must be made in writing and submitted, through the appropriate Department Head or Programme Chair, as soon as practicable, but not later than 21 calendar days after the student was informed of the instructor's decision. The student should attach to the Appeal copies of all relevant documents in order to provide the correct information, and when copies are not available, provide clear references to other documents that the student feels are relevant. The responsible Dean will inform the student in writing of the decision with respect to the Appeal, normally within 14 calendar days of the date of receipt of the completed Appeal from the student.

21.4 If the student is not satisfied with the decision reached by the Dean, an Appeal may be made to Faculty Council. The student must submit the Appeal in writing, within 21 calendar days of receiving the decision of the Dean. The student must submit the Appeal to Faculty Council through the Registrar, and should attach to the Appeal copies of all relevant documents in order to provide the correct information. When copies of documents are not available, the student must provide clear references to those documents that the student feels are relevant. Appeals to Faculty Council will normally be considered at the next scheduled meeting of Faculty Council, provided that the Registrar received the Appeal at least four working days before the scheduled meeting of Faculty Council. The Registrar will inform the student in writing of the decision about the Appeal that was made by Faculty Council.

21.5 If the student's complaint or grievance pertains to the marks awarded on a final exam and cannot be

resolved in an informal manner, the student may make a formal request to have the exam re-evaluated. This request is to be made in writing to the Registrar. The Registrar will forward the request for re-read to the Head of the appropriate department, who will decide how the re-read will be conducted. The result of the final exam re-read will be used to determine the student's final course grade. To ensure that such matters are addressed with due diligence, a request for re-read must normally be submitted not later than 30 days after the student has been made aware of the result. A request for re-read will address only one exam, and normally will not be entertained for assignments, tests, or any other work that has been removed from the custody of the instructor after being marked and recorded.

21.6 A student wishing to make a complaint on an academic issue which is not related to a specific course has to take it directly to the person responsible, whether the programme chair, the head of department or the dean. The complaint or grievance will then follow the process within the delays as prescribed above which apply to the other types of complaints or grievances.

22. Academic Misconduct

22. Academic Misconduct

22.1 The three categories of academic misconduct are as follows:

- a. Cheating, some examples of which are the following:
 - o (1) An act of attempt to give, receive, share or utilize unauthorized information or assistance before or during a test or examination;
 - o (2) Deliberate failure to follow rules on assignments, presentations, exercises, tests, or examination;
 - o (3) Tampering with official documents, including electronic records;
 - o (4) Falsifying research data;
 - o (5) The inclusion of sources that were not used in the writing of the paper or report;
 - o (6) The impersonation of a candidate at an examination.
- b. Plagiarism, which includes the following:
 - o (1) Deliberately and knowingly using the work of others and attempting to present it as original thought, prose or work. For example, this includes failure to appropriately acknowledge a source, misrepresentation of cited work, and misuse of quotation marks or attribution; and
 - o (2) Failure to acknowledge adequately collaboration or outside assistance.
- c. Other violations of academic ethics, including the following:
 - o (1) Deliberately not following ethical norms or guidelines in research;
 - o (2) Failure to acknowledge that work has been submitted for credit elsewhere; and
 - o (3) Misleading or false statements regarding work completed.

22.2 Penalties are imposed upon students found guilty of academic misconduct in consideration of mitigating or aggravating circumstances. Academic sanctions for such misconduct may range from the award of a zero grade for the work involved to a recommendation for expulsion from the College, in cases of aggravated or repeated academic misconduct.

22.3 In cases of repeated or aggravated academic misconduct, when the student is a member of the Canadian Forces, the student's Commanding Officer shall be notified by the Commandant of the Royal Military College of Canada of the infractions. In any instance of academic misconduct by a Canadian Forces member further administrative action may be taken, as deemed appropriate by the member's Commanding Officer.

22.4 Students who are found guilty of repeated or aggravated academic misconduct and, as a consequence, are expelled from RMC may not apply for a degree from RMC nor to be admitted again in

any Programme of Study nor apply to attend any course offered by RMC.

Additional Regulations of the Royal Military College of Canada

Additional Regulations of the Royal Military College of Canada

The Academic Regulations for the RMC Undergraduate Programme were amended effective 1 September 2003. The following Academic Regulations were in effect prior to 1 September 2003 and continue to apply to students attending RMC under the ROTP, RETP and UTPNCM programmes until officially amended or rescinded.

29. To be granted pass standing a cadet must:

- a. achieve a satisfactory standard in Physical Education and in Military Training;
- b. achieve a satisfactory standard in Second Language Training; and
- c. obtain a favourable report in Officer-Like Qualities.

46. A cadet who, in the opinion of the staff, fails to develop the necessary officer-like qualities will, on the approval of the Commandant for such action, be required to withdraw.

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LIEUTENANT-COMMANDER G.A. HANNAH, CD, rmc, pcsc, BA (RMC), MA (King's College, London) - Assistant Professor of Defence Studies.

H. HASSAN-YARI, BA (Mashhad), MA, PhD (UQAM) - Professor of Politics and Head of the Department of Politics and Economics. Cross-appointed to the Department of History at Queen's University.

R.G. HAYCOCK, BA (WLU), MA (Waterloo), PhD (Western) - Professor of History.

P.J. HEFFERNAN, CD, rmc, plsc, BEng, MASc, PhD (RMC), PEng - Associate Professor of Mechanical Engineering.

M. HEFNAWI, BSc (Morocco), MSc (Trois-Rivières), PhD (Laval) - Assistant Professor of Electrical and Computer Engineering.

M. A. HENNESSY, BA (British Columbia), MA, PhD (New Brunswick) - Associate Professor of History and Director of the Department.

J.A. HÉROUX, BEng (McGill), MIng (École Polytechnique de Montréal), PEng - Assistant Professor of Civil Engineering.

Colonel B. HORN, OMM, CD, BA (Waterloo), MA, PhD (RMC) - Associate Professor (Adjunct) of History.

CAPTAIN S. HURLBUT, BSc (RMC), MSc (RMC) - Lecturer of Physics.

M. HURLEY, BA, MA (Western), PhD (Queen's) - Professor of English.

W.J. HURLEY, BSc (Queen's), MBA (York), PhD (Queen's) - Professor of Business Administration and cross-appointed to the Department of Applied Military Science.

A.H. ION, BA, MA (McGill), PhD (Sheffield) - Professor of History.

G. ISAC, LSc, DSc (Bucarest) - Professor of Mathematics and Computer Science.

K. M. JAANSALU, CD, rmc, BEng (RMC), MEng (McGill), PhD (RMC) - Assistant Professor (Adjunct) of Chemistry and Chemical Engineering.

A. JNIFENE, BAsC, MASc, PhD (Ottawa), PEng - Assistant Professor of Mechanical Engineering.

J.T. JOCKEL, BA (St Lawrence), MA (Toronto), PhD (Johns Hopkins) - Professor (Visiting) of Defence Studies.

S.D. JOG, BSc (Hon) Poona, MSc (Poona), MSc (UBC), PhD (McGill) - Professor (Emeritus) of Mathematics and Computer Science.

R.E. JOHNSON, BSc (McMaster), MS, PhD (Penn) - Professor of Mathematics and Computer Science.

D.E.G. JONES, BSc, PhD (Western) - Professor (Adjunct) of Chemistry and Chemical Engineering.

D. KELLY, BSc (Toronto), BEd, Toronto, MEng (RMC), PhD (RMC) - Assistant Professor of Mathematics and Computer Science.

J.L. KENNY, BA, MA, PhD (Carleton) - Assistant Professor of History.

A. KHAZRI, BA, MA (Tunisia) PhD (Montréal) - Assistant Professor of Economics.

H.P. KLEPAK, CD, BA (McGill), MA, PhD (London) - Professor of History.

A. KHAZRI, BA, MA (Tunisia), PhD (montreal) - Assistant Professor of Economics.

LIEUTENANT-COLONEL J. KNACKSTEDT, CD, BComm (McGill), MASc, PhD (Waterloo) - Associate Professor of Military Psychology and Leadership.

G.S. KNIGHT, CD, rmc, BEng, MEng (RMC), PEng, PhD (Queen's) - Associate Professor of Electrical and Computer Engineering.

I. KOCH, BSc (Waterloo), PhD (BC) - Assistant Professor (Adjunct) of Chemistry and Chemical Engineering.

LCOL D.A. LA CARTE, rmc, CD, BA, MA PhD(ABD) (RMC) - Assistant Professor of Politics.

E. LABONTÉ, BA (Queen's) - Language Teacher.

G. LABONTÉ, BSc, MSc (Montreal), PhD (Alberta) - Professor and Head of the Department of Mathematics and Computer Science.

G. LABRECQUE, BA, LL, MA, PhD (Laval) - Associate Professor of Geography and International Law.

MAJOR M. LABRECQUE, CD2, BSc (RRMC), MSc (RRMC) - Lecturer of Physics.

A.R. LACHAÎNE, BSc, MSc, PhD (Ottawa) - Professor of Physics.

P.-A. LAGUEUX, BA, LèsL, MA (Laval), PhD (Paris) - Assistant Professor of French Studies.

P. LAMARCHE, BAsC, MASc (Ottawa), PhD (Waterloo), PEng - Assistant Professor of Civil Engineering.

J. LAMARRE, BA, MA, PhD (Montreal) - Associate Professor of History

P. LANGLOIS, BEng, MEng, PhD (RMC) - Professor (Adjunct) of Electrical and Computer Engineering.

J.P. LAPLANTE, BSc, MSc, PhD (Sherbrooke) - Professor of Chemistry and Chemical Engineering.

LIEUTENANT-COLONEL D.M. LAST, CD, BA (RMC), MA (Carleton), MMAS (USGGSC), PhD (London) - Registrar and Associate Professor of Politics (cross appointed to the Business Administration Department).

D. LAUZON, BA (Queen's) - Language Teacher.

M. LAVIOLETTE, BScA (Laval), PhD (Laval) - Assistant Professor of Mechanical Engineering.

MAJOR J.P.S. LEBLANC, CD, cmr, plsc, BSc (CMR, St-Jean), MEng (RMC), PEng - Assistant Professor in Electrical and Computer Engineering and cross-appointed to the Department of Applied Military Science.

LIEUTENANT-COLONEL K.E. LEE, CD, rmc, plsc, pcsc, BEng (RMC), MSc (RMCS) - Directing Staff in the Department of Applied Military Science.

R. LEGAULT, BA, MA, PhD (Montreal) - Associate Professor of History.

L. LEVESQUE, BSc (Quebec), MSc (Queen's), PhD (Dalhousie) - Assistant Professor of Physics.

CAPTAIN M.C.G. LEHOUX, CD, BEng, MASc (Civil Engineering) (RMC) - Lecturer of Civil Engineering.

B.J. LEWIS, BSc (Toronto), MEng (UTIAS), PhD, PEng (Toronto) - Professor of Nuclear Engineering in Chemistry and Chemical Engineering.

LIEUTENANT COLONEL W.J. LEWIS, CD, rmc, BEng, MBA (Manitoba), MEng, (RMC), BEd, MEd (Queen's), PhD (Western) - Associate Professor (Adjunct) of Chemistry and Chemical Engineering.

S. LIANG, BSc (Toronto), MSc, PhD (Simon Fraser) - Associate Professor (Adjunct) of Chemistry and Chemical Engineering.

Y. LIANG, BSc, MSc (China), PhD (Leeds) - Assistant Professor of Mathematics and Computer Science.

COLONEL (retired) J.G. LINDSAY, OMM, CD, rmc, plsc, qtc, pcsc, ltsc, BEng (RMC) - Head of the Department of Mechanical Engineering and Chief of Staff of the Division of Continuing Studies

G.L.P. LORD, BA, BSc, MSc, PhD (Montreal) - Assistant Professor of Chemistry and Chemical

Engineering.

LIEUTENANT-COLONEL T.W. LOVERIDGE, CD, plsc, pcsc, BA (Bishop's), MA (Old Dominion) - Assistant Professor of History.

L.Y. LUCIUK, BSc, MA (Queen's), PhD (Alberta) - Professor of Geography.

S. LUKITS, BA (Trent), MA (Queen's), PhD (Queen's) - Assistant Professor and Head of the Department of English.

CAPTAIN A. MAC GIOLLA CHAINNIGH, CD, rmc, BEng (RMC), MSc, PhD (Calgary) - Assistant Professor of Physics.

C. MADSEN, BA (Simon Fraser), MA (Western Ontario), PhD (Victoria) - Professor (Adjunct) of Defence Studies.

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R.F. MANN, rmc, BSc, MSc, PhD (Queen's), FCIC, PEng. - Professor Emeritus of Chemistry and Chemical Engineering.

M.-P. MARELLI, BA (McGill), MA (McGill), MBA (Concordia) - Assistant Professor in Business Administration.

R.F. MARSDEN, rmc, BSc (RMC), PhD (Brit Col) - Professor of Physics and Dean of the Faculty of Science.

LIEUTENANT-COLONEL (retired) J. MARTEINSON, CD, BA (Manitoba), MA (York), psc, pcsc, nads - Assistant Professor of History.

MAJOR L. MASSEY, BSc, MSc (RMC), PhD (RMC) - Lecturer in Mathematics and Computer Science.

LIEUTENANT-COLONEL M.C. MAURER, CD, MID, lac, plsc, pcsc, jcsc, Bsc (Ottawa), Msc (Cranfield) - Directing Staff in of the Department of Applied Military Science.

L.C. MCDONOUGH, rmc, BA (RMC), MA, PhD (Queen's) - Professor of Economics.

D. MCGAUGHEY, BSc (Alberta), MSc (Queen's), PEng, PhD (Queen's) - Associate Professor of Electrical and Computer Engineering.

B.J.C. MCKERCHER, BA, MA (Alberta), PhD (London School of Economics), FR HistS - Professor of History and Chair of the War Studies Committee.

LIEUTENANT-COLONEL (Ret'd) M.G. MCKEOWN, MMM, CD, plsc, pcsc, BSc -Civilian Directing Staff in the Department of Applied Military Science.

S. MEHARG, BA (Guelph), MA (RMC), PhD (Queen's) - Professor of Politics (Adjunct).

W.C. MOFFAT, rmc, ndc, BSc, BSc, MSc(Queen's), ScD(MIT), PEng - Professor (Emeritus) of

Mechanical Engineering.

W.W. MOHN, BA (Colgate), PhD (Michigan State) - Associate Professor (Adjunct) of Chemistry and Chemical Engineering.

G.J.A. MONETTE, BA, MA (ens) (Montreal), MA, PhD (Queen's) - Associate Professor of French Studies.

B.K. MUKHERJEE, BSc, PhD (St. Andrews) - Professor of Physics and Head of the Department of Physics.

K.E. NEILSON, BSc, BA, MA (Alberta), PhD (Cantab) - Professor of History.

A.A.M. NICOL, BSc (McGill), MA, PhD (Western) - Associate Professor of Military Psychology and Leadership.

J.-M.A. NOËL, BSc, MSc (Laurentian), PhD (Western) - Assistant Professor of Physics.

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F.A. OKOU, BIng (Ivory Coast), MIng, PhD (E.T.S., Montreal) - Assistant Professor of Electrical and Computer Engineering.

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C. OLLSON, BSc (Queen's), MSc, PhD (RMC) - Assistant Professor (Adjunct) of Chemistry and Chemical Engineering.

B.G. ONG, BSc (Queen's), SM (MIT), PhD (Queen's), PEng - Assistant Professor of Mathematics and Computer Science.

A. OUSMAN, BA, MA (UQAM), PhD (Carleton) - Assistant Professor of Political Science and cross-appointed to the War Studies Programme and the Business Administration Department.

J.Y.S.D. PAGÉ, CD, rmc, BEng, MEng, PEng, PhD (RMC) - Assistant Professor of Chemistry and Chemical Engineering.

R. PAQUET, BA, MA (Laval) - Language Teacher.

P.J. PAQUETTE, BCom (Montreal), MA, PhD (McGill) - Professor of Economics.

B.A. PEPPLEY, BASc (Ottawa), BEd, MSc (Queen's), PhD (RMC) - Associate Professor of Chemistry and Chemical Engineering and Industrial Research Chair.

LIEUTENANT-COLONEL M.B. PHILLIPPE, CD, LL.B, (Montréal), received to the Québec Bar, LL.M (U. Howard in Washington, DC), Director of Office of Military Legal Education, Assistant Professor in the Department of Politics and Economics.

D.C.M. POIREL, CD, rmc, BEng (RMC), MEng (McGill), PhD (McGill), PEng - Associate Professor

of Mechanical Engineering.

CAPTAIN P.E. POIRIER, CD, BEng, MEng, Eng. (RMC) - Lecturer of Chemistry and Chemical Engineering.

Major R. PORTER, CD, BA (RRMC), MSc (Calgary) - Assistant Professor of Military Psychology and Leadership.

R.A. PRETE, BA (Saskatchewan), MA (Brigham Young), PhD (Alberta) - Associate Professor of History.

J.H.P. QUENNEVILLE, rmc, BEng (RMC), MEng (École Polytechnique), PhD (Queen's) PEng - Professor and Head of the Department of Civil Engineering.

G. QUILLARD, BA, MA (Lille), MA (Toronto), PhD (Paris) - Professor of French Studies.

T.J. RACEY, BSc (Waterloo), BEd (Queen's), MSc, PhD (Guelph) - Professor of Physics.

M.H. RAHMAN, BSc (UET, Dhaka), MSc, PhD (Queen's), PEng - Associate Professor of Electrical and Computer Engineering.

CAPTAIN M.W. RANCOURT, CD, BEng (Computer Engineering) (RMC), MEng (Geomatics Engineering) (UNB) - Lecturer of Civil Engineering.

S. RANGANATHAN, ndc, BSc, MSc (Delhi), Mtech (IIT), PhD (Cornell) - Professor of Physics.

R. RAO, BSc, MSc (Andhra U., India), PhD (Bombay, India) - Assistant Professor (Adjunct) of Chemistry and Chemical Engineering.

K.J. REIMER, BSc, MSc (Calgary), PhD (Western), FCIC - Professor of Chemistry and Chemical Engineering.

B. RICHARD, BA (Paris), MA, PhD, Post Doc (UQAM) - Assistant Professor of History.

D. RINFRET, BMath (UQ à Trois-Rivières), PhD (Massachusetts) - Assistant Professor of Mathematics and Computer Science

P. R. ROBERGE, BA, BSc, MChA, PhD (Sherbrooke) - Professor of Chemistry and Chemical Engineering.

P. L. ROCHON, BSc, PhD (Ottawa), PEng - Professor of Physics.

P. ROMAN, CD, rmc, BEng, MEng, PhD - Assistant Professor of Business Administration and cross-appointed to the Department of Applied Military Science.

J. ROUX, BA, Spéc (Lettres) (Algiers), LèsL (Montreal) - Language Teacher.

C.N. ROZON, BSc, MSc (Sherbrooke), PhD (Queen's), PEng - Professor of Electrical and Computer Engineering.

D. RUTA, BA, LèsL, (Laval) - Language Teacher.

A. RUTTER, BSc, MSc (Queen's), PhD (UOttawa) - Assistant Professor (Adjunct) in Chemistry and Chemical Engineering.

CAPTAIN G. SABAT, rmc, BSc, MSc (RMC) - Lecturer of Physics.

K.SCHOBEL, BA(RMC), MBA(RMC), Lecturer in Business Administration

P.J. SCHURER, BSc, MSc, PhD (Groningen) - Professor of Physics.

N. SCHWARTZ-MORGAN, BA, MA (Dijon), MA (Aix en Provence), PhD (Ottawa) - Assistant Professor of Political Science.

G.E. SÉGUIN, BScA, MScA (Ottawa), PhD (Notre Dame) - Professor of Electrical and Computer Engineering.

M. SÉGUIN, BA (Concordia) - Language Centre

C.D. SHEPARD, BSc, MA (Queen's), PhD (Illinois), PEng - Professor of Electrical and Computer Engineering.

M.B.K. SHEPHERD, BA (Université Laval), MA (RMC), Lecturer in Business Administration.

L. SHIRINIAN, BA (Toronto), MA (Carleton), PhD (Montreal) - Professor of English.

N. SHIRINIAN, BA (Carleton), BEd (Toronto), MA (Queen's) - Language Teacher.

R.M. SHOUCRI, BSc (Alexandria), MSc (Laval), MSc (Illinois Institute of Technology), PhD (Laval), PEng - Professor of Mathematics and Computer Science.

B.W. SIMMS, CD, rmc, BEng (RMC), MSc (Toronto), PhD (Queen's), PEng - Professor of Business Administration (Cross appointed to the Mechanical Engineering Department) and Associate Dean of Graduate Studies and Research.

G.E. SIMONS, BMath (Waterloo), MSc (Toronto), PhD (Waterloo) - Associate Professor of Mathematics and Computer Science.

MAJOR R. SMITH, CD, rmc, BEng, (RMC), MSc (Arizona) - Assistant Professor of Electrical and Computer Engineering.

J.J. SOKOLSKY, BA (Toronto), MA (Johns Hopkins), PhD (Harvard) - Professor of Politics and Dean of the Faculty of Arts. Cross-appointed to the War Studies Programme.

C. SPEARIN, BSc (McMaster), MA (Carleton), PhD (UBC) - Assistant Professor of Defence Studies.

P.S. SRI, BSc, MA (Madras), MA (McMaster), PhD (Alberta) - Professor of English.

M.W. STACEY, BSc (Brit Col), PhD (Dalhousie) - Professor of Physics.

R.C. ST-JOHN, BA (Waterloo), MA (Waterloo), PhD (Western) - Associate Professor and Head of the

Department of Military Psychology and Leadership.

A. ST-PIERRE, BSc (Sherbrooke), BScience Comptable (UQ - Montreal), MBA, EdD, CMA, CGA - Professor of Business Administration.

J.A. STEWART, CD, rmc, BEng (RMC), MSc (Waterloo), PhD (Queen's), PEng - Professor of Civil Engineering and Dean of the Faculty of Engineering.

J.C. STONE, BA (Manitoba), MA, PhD (RMC) - Assistant Professor of Defence Studies.

MAJOR R. STOUFFER, BA, MA, PhD (RMC) - Assistant Professor of History.

CAPTAIN M.R. STRAWSON, rmc, BEng (RMC) - Lecturer of Mechanical Engineering.

I. STREIGHT, BA, MA (Victoria), PhD (Queen's) - Assistant Professor of English.

R. TANOVIC, BSc (Sarajevo), MSc, PhD (Zagreb), PEng - Associate Professor (Adjunct) of Civil Engineering.

M. TARBOUCHI, BSc (Morocco), MSc, PhD (Laval) - Associate Professor of Electrical and Computer Engineering.

C. TARDIF, BSc (Montréal), MSc, PhD (Montréal) - Assistant Professor of Mathematics and Computer Science.

M. TÉTREAU, BEng, MScA (École Polytechnique de Montréal), PhD (Queen's), PEng - Assistant Professor of Civil Engineering.

S.M. THOMAS, BSc, MSc (Kerala), PhD (Southern Illinois) - Associate Professor of Mathematics and Computer Science.

W.T. THOMPSON, BSc, MSc, PhD (Toronto), PEng - Professor of Chemistry and Chemical Engineering.

C. THURGOOD, BSc, MSc (Toronto), PhD (Queen's) - Assistant Professor of Chemistry and Chemical Engineering.

S. TIGHE, BSc (Queen's), MSc, PhD (Waterloo), PEng - Associate Professor (Adjunct) of Civil Engineering.

G.M. TORRIE, BSc, MSc, PhD (Toronto) - Professor of Chemistry and Chemical Engineering.

G. TOUSSAINT, BASpéc(Soc), BA (Esp) (Ottawa), Cert Ant (Haiti) - Senior Teacher.

L. TRAHAN, BA SpecL (Montreal) - Language Teacher.

C. TRUDEAU, BA (NS), MA, PhD (Toronto) - Assistant Professor of French Studies.

CAPTAIN R. VINCENT, BSc (Queen's), MSc (RMC) - Lecturer of Physics.

T.B. VINCENT, BA (Dalhousie), MA, PhD (Queen's) - Professor of English.

CAPTAIN N. VLACHOPOULOS, CD, BEng, MEng (RMC), PhD Candidate (Queen's), PEng - Assistant Professor of Civil Engineering

G. WADE, BSc (Toronto), MSc, PhD (Western) - Associate Professor of Physics.

E.J. WALLER, BSc, MScE (New Brunswick), PhD (New York) - Associate Professor (Adjunct) of Chemistry and Chemical Engineering.

E. WARD, LèSL (Damas), MA (Queen's) - Language Teacher.

D.L. WEHLAU, BSc (Western), MA, PhD (Brandeis) - Professor of Mathematics and Computer Science.

R.D. WEIR, CD, BSc (New Brunswick), DIC, PhD (London), FCIC, FEIC, FIUPAC, FRSC, CChem (UK), PEng - Acting Dean of Graduate Studies and Research Division, and Professor of Chemistry and Chemical Engineering.

CAPTAIN L.A. WENDLAND, CD, BEng, MASc, (RMC) - Lecturer of Chemistry and Chemical Engineering.

A.J. WHITEHORN, BA (York), MA, PhD (Carleton) - Professor of Politics and cross-appointed to the War Studies Programme.

MAJOR R.G. WIGHT, CD, rmc, BEng, MEng (RMC), PhD (Queen's) - Associate Professor of Civil Engineering.

J. WOJTYK, BSc, PhD (Queen's) - Assistant Professor of Chemistry and Chemical Engineering.

MAJOR (Retired) C.M. WORTLEY, CD, BEng, MEng (Nova Scotia Technical College), PEng - Assistant Professor of Electrical and Computer Engineering.

G. YANG, BSc (Fudan), MSc (Tongji), PhD (Darmstadt) - Assistant Professor (Adjunct) of Physics.

J.D. YOUNG, BA, (Hons) (Guelph), MScSoc (Laval), PhD (Queen's) - Associate Professor of Politics.

F. YOUSOFFZAI, BA (U.Québec (Mtl)), MSc (Économie) (U.Québec(Mtl)), - Assistant Professor of Business Administration.

B.A. ZEEB, BSc, PhD (Queen's) - Associate Professor of Chemistry and Chemical Engineering.
College Staff
Officers Of Administration

CHANCELLOR AND PRESIDENT - The Minister of National Defence The Honourable Bill Graham, P.C., M.P., BA, LL.D (Toronto), PhD (Paris)

COMMANDANT - Brigadier-General J.P.P.J. Lacroix, CD

PRINCIPAL - J.S. Cowan, BSc (Toronto), MSc (Toronto), PhD (Toronto)

DIRECTOR OF CADETS - Colonel J. G. B. Ouellette, CD, BA, MA
Academic Staff

CHIEF LIBRARIAN - S.J. Toomey, BA, MLS (McGill)

REGISTRAR - Lieutenant-Colonel D.M. Last, CD, rmc, BA (RMC), MA (Carleton), MMAS (USGGSC), PhD (London)

ASSOCIATE REGISTRAR (UNDERGRADUATE) - N. Ballance, BA (New Brunswick)

ASSOCIATE REGISTRAR (GRADUATE) - S. Corbett, BA (York)

ASSOCIATE REGISTRAR (ADMISSIONS) AND MUSEUM CURATOR - J.R. McKenzie, CD, rmc, plsc, BA, MA (RMC)

ASSOCIATE REGISTRAR (LIAISON)/ RED & WHITE NATIONAL COORDINATOR - J.P.R. Hau, CD, BA (Winnipeg), MA (Manitoba)
Military Staff

DIRECTOR OF CADETS - Colonel J. G. B. Ouellette, CD, BA, MA

DEPUTY DIRECTOR OF CADETS - Lieutenant-Colonel R.R. McDonald, CD, plsc, MA

ADJUTANT - Captain K. Wright,

A DIV COMMANDER - Major J.P. Cote

B DIV COMMANDER - Lieutenant-Commander M. Lahaie

C DIV COMMANDER - Major M. Fawcett

CHIEF INSTRUCTOR - Major A. Reiffenstien

STAFF OFFICER TRAINING - Captain M. Gloude

STAFF OFFICER STANDARDS - Captain J. Cowley

CADET WING SERGEANT - MAJOR - Master Warrant Officer M. Colbert, CD

BAND OFFICER AND DRUM INSTRUCTOR - Master Warrant Officer D. Craft, CD

BAND INSTRUCTOR - Warrant Officer S. Gagnon, CD

PIPE-MAJOR - Sergeant J. Donnelly, CD
Athletic Staff

ATHLETIC DIRECTOR HEAD OF THE DEPARTMENT OF ATHLETICS - Mr. D. Cates, BKin (McMaster), MA (Ottawa)

VARSITY MANAGER - Mr G. Dubé, BComm (SPAD) (Laurentian)

PHYSICAL EDUCATION MANAGER - Ms. N. Tremblay, BSc (Concordia), PFLC, CSCS, NCCP II Canoeing- Kayacking, NCCP I Cross Country Skiing, Instructor CFC, NLS

RECREATION AND INTRAMURAL MANAGER - Mr M. Robillard, CD

WOMEN'S SOCCER PROGRAM COORDINATOR AND HEAD COACH - Mr C. Beaulieu, BSc H.K. (Ottawa), NCCP III, Ontario Soccer Association Provincial "B" License

PHYSICAL EDUCATOR REMEDIAL PROGRAM COORDINATOR - Mrs N. Woods, CD, CFC, NCCP I Volleyball, Spinning Maddog, NLS, Pers & Trg Level II

PHYSICAL EDUCATOR AQUATIC PROGRAM COORDINATOR - Mr N.J.M. Breuvar, CD, ECPHV I, NCCP I Soccer, Swimming Inst, Bronze Sail IV Sailing, Canoe Inst Level I, First Aid Inst, Personal Trainer Level I SPI

PHYSICAL EDUCATOR INDIVIDUAL SPORTS PROGRAM COORDINATOR - Mr B. Bennett, CD, CFC, NCCP II Volleyball

PHYSICAL EDUCATOR MILITARY SKILLS PROGRAM COORDINATOR - Mr J. Blanchet, CD, CFC Rappel Master

PHYSICAL EDUCATOR COLLECTIVE SPORTS PROGRAM COORDINATOR - Ms S. Bruff, BPed (Memorial), BA (Memorial), BEd (Memorial), MA (Queen's), NCCP III Volleyball, NCCP III Soccer, NCCP I Canoeing, White Sail Sailing, NCCP I Powerlifting, CFC

PHYSICAL EDUCATOR EVALUATION PROGRAM COORDINATOR - Mr D. Gaboury, BPhEd (Laval), CFC, NCCP III Volleyball, NCCP I Broomball, NCCP I Handball, NCCP IV Task 3 (Volleyball Canada), Power lifting I

VARSITY COORDINATOR - Mr J. Girard, CD, NCCP Level II Badminton

FENCING PROGRAM COORDINATOR AND HEAD COACH - Mrs P. Howes, CHPC - BA (Carleton), National Coaching Institute diploma in high performance coaching (Winnipeg), NCCP IV Fencing, Prevot d'Armes Diploma

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ATHLETIC THERAPIST - Mr S. Lawless, BSc (Queen's), MSc (Queen's), MCPA, Licensed Physiotherapist

MEN'S VOLLEYBALL PROGRAM COORDINATOR AND HEAD COACH - Mr S. Leknois, CD 1, NCCP III Volleyball, NCCP I Soccer

PHYSICAL EDUCATOR TAEKWONDO COACH - Combative Program Coordinator - Mr P. Nicol, CD, BA (CMR), CFC, 4th Dan WTF TKD, NCCP III Theory, NCCP I Handball

MEN'S HOCKEY PROGRAM COORDINATOR AND HEAD COACH - Mr K. Nobes, M.A. (McGill), BEd (McGill), NCCP Advanced I Hockey

MEN'S BASKETBALL PROGRAM COORDINATOR AND HEAD COACH - Mr C. Norman, BA

(Concordia), Graduate National Coaching Institute (Toronto), NCCP IV Basketball

PHYSICAL EDUCATOR CURRICULUM DEVELOPMENT COORDINATOR - Mr S. Ferguson, BA (UWO), MSc (York), CFC, PFLC

MEN'S SOCCER PROGRAM COORDINATOR AND HEAD COACH - V. Mendes, HR Marketing (St- Lawrence College (Kingston))

WOMEN'S BASKETBALL PROGRAM COORDINATOR AND HEAD COACH - Captain B. Schur, BA (RMC), NCCP III Basketball

ACTING ASSISTANT RECREATION AND INTRAMURAL - Ms T. Marshall, Business Diploma, NCCP I Swimming, NLS (Pool/Waterfront), First Aid/CPR, First Aid/CPR Instructor, Bronze Med/Bronze Cross Instructor/Examiner, Red Cross Swimming Instructor, Aquafit/Step Instructor, CFC CSEP, WHMIS

SHOOTING PROGRAM COORDINATOR AND PISTOL HEAD COACH - Mr A. Wilkinson, BA (Queen's), NCCP II Pistol
Chaplains

CHAPLAIN (PROTESTANT) - Major C. Ryan, CD

CHAPLAIN (ROMAN CATHOLIC) - Major Jean-Yves Fortin