



The Royal Military College of Canada

Response to

**Report 6, Royal Military College of Canada - National Defence
of the 2017 Fall Reports of the Auditor General of Canada**

10 July 2019

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Executive Summary

Since its establishment nearly a century and a half ago, the Royal Military College of Canada (RMC) has provided over 20,000 young officers to lead the women and men of the Canadian Armed Forces (CAF). The fact that these leaders have carried out their duties with distinction for over a century, through two world wars and dozens more conflicts speaks to the quality of the education and training they received during their time at RMC. What speaks just as convincingly to the value-added of the RMC experience are the hundreds upon hundreds of remarkable graduates who have contributed invaluable to Canadian society and abroad, many of whom are recognized on the RMC Wall of Honour and elsewhere across Canada.

In 2017, on the conclusion of his Special Staff Assistance Visit (SSAV), the Chief of the Defence Staff (CDS) identified key areas for improvement at RMC and re-emphasized the importance of RMC's four-pillar program, which demands success in the four domains of military leadership, academic studies, bilingualism and physical fitness. That same year, Canada's Auditor-General (AG) tabled a report in Parliament that made several important recommendations regarding the RMC program that is delivered as part of the Regular Officer Training Plan (ROTP). These included ensuring: that the training provided to RMC's Officer and Naval Cadets is relevant to service in the CAF; that the costs associated with the training program are reasonable; that the higher standards demanded of RMC's Officer and Naval Cadets result in better-qualified officers; the reaffirmation of the Commandant's role in overseeing and integrating the military training and academic programs; that Officer and Naval Cadets are sufficiently prepared to lead with exemplary conduct and ethical behaviour; and, that RMC's military staff is well prepared to develop Officer and Naval Cadets in this training program.

Since the publication of the SSAV and AG reports and with strong support of the entire leadership team, RMC has made significant improvements in every facet of the RMC-ROTP program. RMC also published Strategic Plan 2023 which brings a continued focus to these efforts and other positive initiatives. This report responds in full to the AG's recommendations. With the context set, the report discusses RMC's governance, clear in its purpose of providing the Commandant and his leadership team the best structure to optimize and integrate all elements of RMC's training programs for Officer and Naval Cadets. The following chapter explains the uniqueness of the RMC-ROTP, a regimen that requires the balancing of that which is deemed critical to high quality leadership, as well as an overview of the four-pillar program, which affords Officer and Naval Cadets rigorous challenges with the highest of standards throughout their time at RMC. The next two chapters explain in detail how military training has been strengthened and tailored to ensure relevance to the Profession of Arms as well as the efforts in place to ensure military training activities and academics are in sync. There is also a discussion of how RMC sees the evolution of the academic programs and what efforts are underway to optimize cost efficiencies.

The final chapter responds directly to the AG's observations regarding expenditures. It speaks to the value proposition of the RMC-ROTP program and provides comparisons to other officer production programs and to other educational institutes. It is important that the reader recognize

that the methodology employed for this report is similar to that used by the AG for their report. This report validates the expenditures highlighted in the AG report and concludes that RMC does spend more money per student than some other Ontario universities. However, this report demonstrates that when compared to 19 other universities and adjusted for scope and size, RMC's expenditures are exactly where they are expected to be for a university in Ontario. This conclusion is not consistent with the AG report, the explanation of which could be that the AG's analysis may have used too small of a sample size for comparison and did not account for RMC's enhanced scope.

While providing sound recommendations for improvement, the AG report admitted to not taking revenue into consideration as part of the analysis. This report highlights the importance of key revenue streams to RMC and also that the AG report mistakenly attributed all of RMC's annual expenditures to the RMC-ROTP program. This report shows that a healthy portion of the RMC budget is invested in other mandated tasks in support of the CAF, including research, graduate education, as well as programs in support of the Canadian Army and other DND agencies. When this is taken into consideration, the expenses incurred by RMC to produce a new officer for the CAF falls into line with that of Ontario universities, other military academies and other officer enrollment programs.

This report recognizes the value to the CAF in having a diverse mix of educational backgrounds in officer production. With relative cost parity established, the report focuses on the value added to a graduate of the RMC-ROTP program as compared to other officer production programs. While each RMC graduate will have invested similar time in class to any civilian ROTP graduate or Direct Entry Officer, RMC's education is provided in a military environment with smaller, better tailored courses by professors directly attuned to military needs and goals. In addition, the RMC graduate will have invested hundreds of hours in military training, all aimed at honing the skills needed in their coming careers as leaders. The physical fitness training program is aimed not only at developing lifetime health habits and skills, but also at nurturing in each graduate a sense of camaraderie and competition born on the sports fields, in the gym or in the arena. Finally, language training aims to bring each graduate to a functional level in both of Canada's official languages, and it is overwhelmingly successful in this task. No other officer production program develops Officer and Naval Cadets in such a comprehensive way.

This report represents the collective work and contributions of many among RMC's faculty and staff. The reader will find in its pages a dedication to quality that reflects the concerted effort that RMC commits to its change agenda and to the continued production of superb officers for the CAF. The care taken in the publication of this report will ensure that it will stand as a keystone document for RMC for years to come. The sincerest of appreciation goes to everyone involved. Special recognition is given to the significant assistance of General (Retired) Tom Lawson, whose experience as a previous RMC Commandant and Chief of the Defence Staff has been instrumental to the review process, and whose connection with and support to RMC continues to be simply inspiring. His insightful contributions have enabled us to tell the "RMC Story" in a factual and comprehensive manner, one that captures all that we are doing in response to the SSAV and AG reviews and with a vision to the future that will ensure RMC continues on a path of renowned success.

1. Introduction

1.1. Setting the context

The Royal Military College of Canada (RMC) opened on 1 June 1876 with the enrolment of the first 18 cadets, remembered fondly as ‘The Old Eighteen’. A military unit, RMC was founded “...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 and for qualifying officers for command and for staff appointments.”¹ In 1959, RMC achieved university status with the authority to grant degrees in the Arts, Science and Engineering.² According to McKenzie, it was recognized from the very beginning that the RMC degree needed to be different.³

During the 1990s, an era of Defence spending cuts arrived.⁴ The effect on the Canadian Military College (CMC) system was significant with the closure of Royal Roads Military College in Victoria and Collège militaire royal in Saint-Jean, leaving RMC as the sole Military College in Canada. In addition, the newly appointed Board of Governors (BoG) studied the RMC program “[t]o ensure for each graduate, a broad-based education, well grounded in the sciences and humanities, with special emphasis being placed on the development of values, ethics and leadership skills needed for responsibilities and service to country.”⁵ The study was led by former Chief of the Defence Staff, General (Ret’d) Ramsey Withers. The Withers’ Report has become known for formalizing the military-relevant core curriculum, a key differentiator that sets the RMC undergraduate degree apart from any other Canadian university by its foundation of broad-based education, grounded in the sciences and humanities and with course material directly connected to the Profession of Arms.

As Coombs reports, the 1990s also had a profound impact on officer generation with the establishment of new policies that included, “...the need for a ‘degreed’ officer corps and emphasis upon higher level education...”⁶ It was the Morton Report that influenced the Minister of National Defence (MND), the Honourable Doug Young, to adopt the recommendation that all officers require a university degree.⁷

1 An Act to establish a Military College in one of the Garrison Towns of Canada, (1874).

2 The Royal Military College of Canada Degrees Act, 1959.

https://www.cicic.ca/docs/postsec/RMCC_degrees_act_1959.pdf

3 McKenzie, R. (2001). “Military Knowledge and Scientific Pursuits...,” Royal Military College of Canada: The First 125 Years, *Canadian Military Journal*, 18.

4 Chief Review Services, Director General Audit, Audit of Force Reduction Program, 7055-29(DGA), January 1997, http://www.forces.gc.ca/assets/FORCES_Internet/docs/en/about-reports-pubs-audit-eval/705529.pdf

5 RMC Board of Governors, Report to the Board of Governors by the Withers’ Study Group, “Balanced Excellence: Leading Canada’s Armed Forces in the New Millennium,” Kingston, Department of National Defence internal document, 30 April 1998.

6 Coombs, H. G. (2017). 25 Years after Somalia: How it Changed Canadian Armed Forces Preparations for Operations. *Canadian Military Journal*. 17:4, 42.

7 Young, D. (1997). Report to the Prime Minister on the Leadership and Management of the Canadian Forces. Department of National Defence.

In support of these requirements and goals, the primary mission of RMC is to “deliver the Regular Officer Training Plan (ROTP) by educating, developing and inspiring bilingual and fit, ethical leaders to serve the Canadian Armed Forces (CAF) and Canada with distinction.”⁸ The ROTP is one of several officer entry plans for the CAF and is open for candidates to attend either RMC or a civilian university. RMC continues to provide approximately 25% of the officers enrolled annually into the CAF.

While recent reviews focused only on the ROTP-RMC program, there is much more that RMC delivers. Essential to its core mission, RMC also delivers undergraduate and graduate university education to officers and non-commissioned members of the CAF and Department of National Defence (DND) civilians, both in residence and at a distance. RMC further serves to uphold and advance the Profession of Arms by carrying out research appropriate for a modern Defence university. Some of RMC’s research is sensitive and classified and is often conducted at RMC in direct support of operations.

Additionally, RMC provides a wide range of professional military education and expertise to meet the needs of the CAF, DND and other government agencies. RMC delivers a broad spectrum of short courses that contribute to technical education and supports technical investigations and research of operational significance to the CAF. Specialty education includes courses in cyber-security and electronic warfare, the Aboriginal Leadership Opportunity Year (ALLOY) and the Non-Commissioned Member Executive Professional Development Program (NEPDP). Other Defence-related programs include the Army Technical Warrant Officer (ATWO) program and the Army Technical Staff Officer (ATSO) program as well as Ammunition Engineering and Aircraft Structure, both programs of which were repatriated to Canada for cost savings and to ensure program availability.

1.2. Special Staff Assistance Visit

On the heels of the tragic loss of several RMC students, the Chief of the Defence Staff (CDS), General Jonathan Vance, deployed a Special Staff Assistance Visit (SSAV) team to RMC in November 2016 to help deal with “...growing concerns with the prevailing climate at the unit.”⁹ “A SSAV is a tool used by the senior leadership of the CAF to obtain a full and accurate picture of the state of a unit or function.”¹⁰ Accordingly, General Vance gave the SSAV the mandate “...to assess the overall climate, training environment, culture, and Regular Officer Training Plan (ROTP) program construct at the Royal Military College of Canada (RMC), and how these factors impact the morale, welfare and success of the Naval and Officer and Naval Cadets (N/OCdts) at the College.”¹¹

8 Ministerial Organization Order 2007070 (Royal Military College of Canada)

9 Maddison G.R., Neasmith D.G., et al. (2017). Special Staff Assistance Visit - Report on the Climate, Training Environment, Culture and Regular Officer Training Plan (ROTP) Programme at the Royal Military College of Canada – Kingston,” <https://www.canada.ca/content/dam/dnd-mdn/documents/reports/20170329-rmc-ssav-report-final.pdf>, 1.

10 Ibid. 1.

11 Ibid. 1.

The SSAV team provided its response in what has become known as the Maddison-Neasmith Report, which indicated that "... overall RMC is delivering on its mission of producing well educated officers to serve as leaders in the CAF." The team brought forward 79 recommendations for improvement.¹² General Vance accepted all recommendations and added 11 more. These 90 action items addressed issues with respect to stressors, morale, command and control, governance, Training Wing staff, support services and the four-pillar program. In his address to RMC faculty, students and staff on 29 March 2017, General Vance reiterated the importance of RMC's four pillar program, emphasizing that each pillar is essential for commissioning from the ROTP at RMC.

In his Initiating Directive published on 5 April 2017, General Vance directed an aggressive implementation plan for the 90 action items with performance measures and a tracking system.¹³ To date, 75% of these have been implemented. The majority of the remainder of these items require longer timelines as they involve an investment in human resources, organizational changes, new or improved infrastructure, and updates to policies and Queen's Regulations and Orders, etc.¹⁴ While the majority of the work to be conducted in response to the SSAV is now interdependent with external organizations, RMC will continue to track its status and implementation to completion.

1.3. Auditor General Report

In the summer of 2016, the Auditor General (AG) of Canada initiated an examination of RMC with the goal "...to provide objective information, advice, and assurance to assist Parliament in its scrutiny of the government's management of resources and programs..."¹⁵ The resulting AG Report was tabled in Parliament on 21 November 2017. The audit focused on two areas: "...whether RMC produced the quality of officers that the Canadian Armed Forces (CAF) needed at a reasonable cost..." and "...whether DND ensured the proper conduct of Officer and Naval Cadets and staff at RMC."¹⁶

All recommendations for improvement brought forward by the AG were endorsed by DND. The following six recommendations were made:¹⁷

- National Defence should clearly define and strengthen its military training of Officer and Naval Cadets at RMC so that the training is relevant and practical and provides value to operational units. RMC should then integrate the improved military training with the academic education of Officer and Naval Cadets;

¹² Ibid. 52.

¹³ CDS Directive for Royal Military College of Canada (RMC) Special Staff Assistance Visit (SSAV) Action Plan, dated 5 April 2017.

¹⁴ RMC SSAV Quarterly Report 7 (internal document), dated 1 March 2019.

¹⁵ Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017). [Report 6—Royal Military College of Canada—National Defence. http://www.oag-bvg.gc.ca/internet/English/parl_oag_201711_06_e_42671.html.](http://www.oag-bvg.gc.ca/internet/English/parl_oag_201711_06_e_42671.html)

¹⁶ Ibid.

¹⁷ Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017).

- National Defence should explore ways to reduce RMC’s operating cost per student and consider reducing the number of programs offered;
- National Defence should demonstrate and ensure that the higher standards of the ROTP-RMC are required, that they result in better qualified officers, and that the cost is reasonable;
- National Defence should clearly define the role of the Commandant as the executive authority for day to day operations and long term planning of all aspects of RMC’s operations, particularly the ability to oversee and integrate military training and academic programs;
- RMC should ensure that before senior Officer and Naval Cadets are appointed to leadership positions, they demonstrate high standards of conduct and ethical behaviour; and
- RMC should ensure that military training staff have the proper skills and training they need to develop leadership skills among Officer and Naval Cadets.

Many of the AG’s observations were similar to those of the SSAV in that they reported on weaknesses in the military training program and a lack of balance between military training and academic programs; however, the AG also provided the following observation:

“Unless National Defence can resolve the issues identified in this report and the Special Staff Assistance Visit report, the Royal Military College of Canada risks becoming just another university and not providing the Canadian Armed Forces with the leaders it requires.”¹⁸

As articulated in its Detailed Action Plan in response to the AG Report, DND accepted the AG recommendations and committed to change.¹⁹ In May 2018, the results of the AG report were also presented to the Standing Committee on Public Accounts (SCoPA). The Public Accounts Committee supported the conclusions of the AG and recommended that DND provide seven additional reports. These reports include: progress as to how RMC is strengthening military training and integrating it with academic education; progress regarding cost effectiveness; comparing costs to other officer entry plans, operating cost per student to other universities of similar size and the rationale behind comparing RMC to other allied military institutions; demonstrating the value-added of RMC; better defining the role of the Commandant; ensuring proper conduct and ethical behaviour in cadets who hold leadership positions; and ensuring military training staff have the proper skills and training.²⁰

18 Ibid.

19 Detailed Action Plan for Office of the Auditor General Report Recommendations, Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017). [Report 6—Royal Military College of Canada—National Defence, http://www.ourcommons.ca/Content/Committee/421/PACP/WebDoc/WD8148750/Action_Plans/70-DepartmentOfNationalDefence-e.pdf](http://www.ourcommons.ca/Content/Committee/421/PACP/WebDoc/WD8148750/Action_Plans/70-DepartmentOfNationalDefence-e.pdf)

20 Report of the Standing Committee on Public Accounts, Report 6, Royal Military College of Canada—National Defence, of the 2017 Fall Reports of the Auditor General of Canada. (May 2018), http://publications.gc.ca/collections/collection_2018/parl/x16-1/XC16-1-1-421-46-eng.pdf

1.4. The RMC Strategic Plan 2023

The leadership at RMC has used the SSAV action items and AG's recommendations to undertake a broad agenda of improvement. Many changes are now in place and the remainders are in progress. To ensure timely completion of follow-up action and to define the way forward, RMC has produced Strategic Plan 2023, based on a comprehensive strategic planning process, a clear assessment of the current situation and a definition of the desired future state so that action plans could be established to address the gaps.²¹

The RMC Strategic Plan 2023 is not an end state but a rather a marker to help RMC evolve as it should to serve the women and men of the CAF, Canada and the global community. It recognizes RMC's priority of producing bilingual, fit and ethical junior officers, ready to lead with distinction, supporting the ROTP in a way that sets RMC apart from any other university in Canada. It also recognizes that there is much more that RMC delivers over and above the ROTP, from graduate and distance education to world-class research with growing capabilities such as cyber-security and support to Space operations.

The RMC Strategic Plan 2023 is the culmination of many hours of work and the result of many contributions. It has been shaped by the SSAV and AG reports and is aimed at ensuring RMC evolves appropriately and continues to meet the needs of the service and the Canadian Defence Policy: *Strong, Secure, Engaged*.²² Accordingly, RMC's efforts will be focused on the following three outcomes:²³

Preparing officers to excel.

- ❖ Generating bilingual and fit officers prepared to lead with distinction.

Supporting the Defence Program.

- ❖ Educating members of the Defence community.
- ❖ Providing sound advice and timely expertise.
- ❖ Contributing to and upholding the Profession of Arms.

Ensuring RMC's recognition as a unique and inclusive military university.

- ❖ Inspiring a bilingual world-class military university.
- ❖ Leading in Defence research.
- ❖ Fostering a positive student-centric learning environment for the production of future leaders.

The core values that underpin RMC as a learning organization include: Integrity, Respect, Excellence, Unity of Purpose and Academic Freedom. To be successful, RMC has examined its

21 RMC Strategic Plan 2023

22 Canada, Department of National Defence (DND), *Strong, Secure, Engaged: Canada's Defence Policy* (June 2017).

23 RMC Strategic Plan 2023

business processes, internal enablers and resource management and is committed to the following priority actions.²⁴

Our Business

- ❖ Delivering on the four-pillar program.
- ❖ Delivering high-quality education in both official languages.
- ❖ Ensuring effective communications and engagement.
- ❖ Establishing and maintaining high standards.
- ❖ Engaging in research.
- ❖ Fostering a positive work environment.

Internal Enablers

- ❖ Embracing our institutional culture and values while respecting diversity.
- ❖ Supporting qualified and experienced personnel.
- ❖ Pursuing clear and effective governance.
- ❖ Encouraging innovation in people, processes and technology.
- ❖ Adopting appropriate policies and procedures.

Resource Management

- ❖ Investing in our people.
- ❖ Ensuring responsible stewardship.
- ❖ Pursing appropriate and sustainable support.
- ❖ Encouraging stable funding.
- ❖ Increasing student throughput.

These priority actions have been incorporated into a campaign plan as part of the RMC Strategic Plan 2023. The next step in the RMC strategic planning process is building a balanced scorecard that defines specific performance metrics and enables RMC to track progress.

²⁴ Ibid.

2. Governance

2.1. Organization

As for any military unit in DND, RMC's organization and mission are defined by Ministerial Organizational Orders (MOOs) and Canadian Forces Organizational Orders (CFOOs) in accordance with the National Defence Act (NDA).²⁵ RMC is a subordinate unit to the Canadian Defence Academy (CDA); therefore, its external accountability is exercised through the CDA chain of command, to include oversight of operational, administrative and financial matters. Other units within the CDA formation include Royal Military College Saint-Jean (RMC Saint-Jean) and the Canadian Forces Colleges (CFC). Together RMC and RMC Saint-Jean represent the Canadian Military Colleges (CMCs).

A unique feature of RMC is that, while it is a federal unit it has degree granting authorities from the Province of Ontario and is therefore recognized as a provincially chartered university and consequently holds associate membership with the Council of Ontario Universities (COU). RMC's authority to confer university degrees comes from Ontario legislation, the Royal Military College of Canada Degrees Act, 1959.²⁶

Similar to most Canadian universities, RMC's university governance employs a bicameral system. Bicameralism is a governance structure that balances, "...the need for external accountability to the state which financially supports the institution with the need for the participation of the professorate in decisions that focus on academic standards."²⁷ While the two governing legislative bodies typical to most universities are the university Board of Governors (or Board of Trustees) and the Senate, RMC's bicameralism is executed through a balance of various governing bodies for aspects related to financial accountability and the RMC Senate for matters related to academic standards.²⁸

One of those governing bodies is the RMC BoG, which was established in 1997 to provide "...advice and recommendations to the Minister of National Defence concerning all matters related to RMC."²⁹ The terms of reference for the RMC BoG were updated in 2011 and include approval authority for academic programs, advisory responsibilities to the Commander CDA for activities and programs at RMC, and the recommendation of candidates for the appointment of the Principal, to name a few. The BoG consists of a "Chair, nine ordinary members, seven ex-officio members and one member designated by the Royal Military Colleges Club of Canada (RMC Club), for a total of 18 members."³⁰ The Commander CDA serves as BoG Vice-Chair with both the RMC Commandant and Principal serving as members.

25 *National Defence Act*, R.S.C., 1985, c. N-5

26 *The Royal Military College of Canada Degrees Act*, 1959.

27 Jones G.A. (2002). F-16.

28 *Ibid.*

29 RMC Board of Governors, <https://www.rmc-cmr.ca/en/college-commandants-office/rmcc-board-governors>

30 RMC Board of Governors, Terms of Reference, <https://www.rmc-cmr.ca/en/college-commandants-office/terms-reference>

In response to recommendations on governance brought forward by the SSAV and the AG, the CDS created a Council of Commandants, with the CDS as Chair, to ensure the programs delivered at both CMCs are consistent with the objectives and employment requirements of the CAF. This Council meets twice a year, providing the Commander CDA and the CMC Commandants a forum in which to engage the CDS directly.³¹

2.2. The Role of the Minister of National Defence

Subsection 44(2) of the NDA states that RMC "...shall be governed and administered in the manner prescribed by the Minister."³² The QR(Canmilcols)³³ goes on to clarify that Minister of National Defence (MND) is the "...Chancellor of the Royal Military College of Canada..." and "...President of each of the colleges." This was articulated in the 1959 Queen's Regulations and Orders for Canadian Service Colleges (QR(Canservcols)) and remains in place today over 60 years later.³⁴

2.3. The Role of the Commandant

RMC is led by a Commandant, normally at the rank of Brigadier-General or Commodore, with the authority to command the unit as a Commanding Officer as outlined in the NDA. Accordingly, the Commandant is accountable for the entire institution. The Commandant also serves as RMC's Vice-Chancellor; this decision is reflected in the 1986 Queen's Regulations and Orders for Canadian Military Colleges (QR(Canmilcols)).³⁵

In response to the SSAV and AG recommendation, the proposed length of the Commandant's tour has been extended from two to three years to provide strategic continuity in leadership and to strengthen the Commandant's role in the long-term planning of RMC's operations.³⁶ The Commandant exercises authority over the ROTP in many ways, including weekly coordination meetings and quarterly College Executive Committee meetings. The Commandant is also the Chair of the RMC Senate.

Also in response to the recommendation of the SSAV, RMC has created a position of Deputy Commandant (DCmdt) at the rank of Colonel (or Captain (Navy)). The benefits of this position are to raise the visibility and to ensure the balance of all activities on the College Activities Calendar as well as to allow for a focal point for events and support services.

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32 *National Defence Act*, R.S.C., 1985, c. N-5

33 1986 Queen's Regulations and Orders for Canadian Military Colleges (QR(Canmilcols))

34 1959 Queen's Regulations and Orders for Canadian Service Colleges (QR(Canservcols))

35 1986 Queen's Regulations and Orders for Canadian Military Colleges (QR(Canmilcols))

36 SCoPA response

2.4. The Role of the Principal

The RMC Principal (originally referred to as the Director of Studies³⁷) holds a Governor-in-Council appointment with responsibilities that have been delegated by the MND through Ministerial Directives.³⁸ Accordingly, the Principal is RMC's university representative and Academic Head. In the absence of the Chancellor and Vice-Chancellor, the Principal holds the authority of the President to confer degrees.³⁹ The Principal is also the academic advisor to the Commander CDA and the senior academic advisor in DND. Providing corporate leadership in the management of a national university, the Principal is accountable to the Commandant for all academic activities of the College, and for ensuring RMC is recognized internationally as an accredited university of academic excellence.⁴⁰

RMC exercises academic self-governance, a fundamental tenet for all universities, through the academic leadership of the Principal, Vice-Principals, Deans and Department Heads and through university governance that is maintained through Faculty Board, Faculty Council and Senate. Academic self-governance is expressed through the development, approval and delivery of curriculum, the review of student progress and marks, and admissions as well as the selection of the academic leadership and hiring of new faculty and staff. Essential to academic self-governance and a core value at RMC is academic freedom as articulated in the Collective Agreement for the University Teaching (UT) Group.⁴¹

2.5. The Role of the Director of Cadets

The Director of Cadets (DCdts) is the Commanding Officer of the Cadet Wing, responsible for the overall conduct, supervision, discipline, and performance of cadets. In response to the recommendations by the SSAV, the rank of the DCdts' position was upgraded from Lieutenant-Colonel (or Commander) to Colonel (or Captain (Navy)) effective July 2017. As an officer of higher military rank, the DCdts has the ability to draw on additional military experience as well as time in command. The DCdts is also a member of the RMC Senate as the Dean of Students.

2.6. Governance Review

In response to the AG report, RMC has conducted a governance review, the results of which are detailed in the Report of the RMC Governance Committee.⁴² As articulated in the report, this committee made use of an array of sources to benefit its work. It examined primary source documents, consulted the Judge Advocate General's Office, as well as a previous Commandant and Principal and drew from a workshop on university governance conducted by Universities Canada.

37 The Royal Military College of Canada Degrees Act, 1959.

38 Minister of National Defence, Ministerial Directives Respecting the Principal of the Royal Military College of Canada, 23 November 2006.

39 Minister of National Defence, Letter to the Commandant of the Royal Military College of Canada, 22 June 2009.

40 Minister of National Defence, Ministerial Directives Respecting the Principal, 23 November 2006.

41 Inspiring Excellence: The Strategic Plan for the Academic Wing at the Royal Military College of Canada, <https://www.rmcc-cmrc.ca/sites/default/files/sfaw-csee-eng.pdf>

42 Report of the RMC Governance Committee (Internal document), 23 October 2018

The RMC Governance committee concluded that RMC's governance as a military unit and a provincial chartered university is sound but there are a number of seams and gaps that need to be addressed.⁴³ The committee observed that updating the QR(Canmilcols) will address the issues, but this process can be quite lengthy. In the interim, there are areas for clarification that could be mitigated through Ministerial authority, pending formal update of the QR(Canmilcols).⁴⁴ The recommendations from the RMC Governance Committee are now part of a CDA Working Group on Governance, which was recently established to consider the recommendations and to initiate an amendment to the QR(Canmilcols).

43 Ibid, 6.

44 Ibid, 6.

3. Supporting the Regular Officer Training Plan

3.1. The Four Pillar Program

In delivering undergraduate education in the ROTP program, the RMC environment surrounds Officer and Naval Cadets with a military culture and a military ethos that provides them with a foundation for understanding and appreciating the Profession of Arms, a foundation of education, bilingualism and fitness that prepares them to excel in service. Success in the ROTP at RMC requires the completion of four pillars: military, academic, second language ability and physical fitness. While the pillars are described separately below, all four pillars are interconnected.

The Military Pillar: RMC places particular importance on the development of personal integrity, ethical behaviour, military ethos, professional responsibility, leadership qualities and officership within the CAF. To this end, formal and informal professional education and military training is delivered by RMC's Training Wing (TW). Throughout the Officer and Naval Cadets' years at RMC, there is exposure to leadership appointments and associated guidance, mentoring and coaching. Experiential leadership is also provided through mandatory involvement in sports, and voluntary membership in an array of clubs and recreational activities.

The Academic Pillar: RMC's academic programs compete with those found in the finest universities across Canada. For ROTP students at RMC, class attendance is mandatory; it is an Officer and Naval Cadet's place of duty for much of each weekday. Arts, Science and Engineering programs are on offer and most students can choose their degree program. However, employment in some CAF occupations requires certain degrees as a prerequisite.

The Bilingualism Pillar: Bilingualism enables RMC graduates to communicate effectively in both of Canada's Official Languages immediately upon graduation. Success in this pillar also provides RMC graduates with a solid foundation to continue their second language development during their career and reduces future second language training costs for DND. For these purposes, all RMC Officer and Naval Cadets undergo second language training and are required to achieve the Federal Public Service Standard of BBB prior to receiving their commission as an officer. This training is conducted during the academic year and during summer training sessions.

The Physical Fitness Pillar: The Athletic Program provides opportunities for Officer and Naval Cadets to participate in wide range of physically and mentally demanding activities and sports in order to develop their overall physical capabilities, self-confidence and leadership abilities. All Officer and Naval Cadets take fitness courses and are required to participate in intramural, club or varsity sports. In order to graduate, all Officer and Naval Cadets must meet or exceed the standard on both a CAF fitness test and a demanding RMC Physical Fitness Performance Test (PPT). The Athletic Program also has a holistic focus on mental health and wellness, resilience, and nutrition. The physical fitness pillar is designed to ingrain in RMC graduates a lifelong commitment to health and fitness and the ability to lead their subordinates in developing their own fitness regimes and philosophies.

3.2. RMC: The University with a Difference

RMC is a recognized university renowned nationally and internationally as an institution of academic excellence. In support of its mission, RMC is committed to delivering education of the highest quality at the undergraduate and graduate levels as well as in specialized professional development programs. Quality assurance for RMC's academic programs is governed by COU's Quality Council through its Institutional Quality Assurance Process (IQAP). RMC's undergraduate engineering programs are additionally accredited through Engineers Canada. Undergraduate engineering programs require accreditation as they provide the education necessary for licensure as Canadian Professional Engineers.

The RMC-ROTP undergraduate degree is different than any other degree in Canada. It provides a broad-based education directly connected to the Profession of Arms through a core curriculum that is provided to every cadet. RMC's core curriculum comprises approximately 30% of the degree requirement with courses that include, for example, writing, history, mathematics, politics, sciences, psychology and leadership, military profession and ethics. These courses are connected to the Officer General Specification and address military educational requirements to provide the knowledge considered fundamental for a career in the service.⁴⁵ RMC's core-curriculum takes the place of the majority of the 'elective' courses offered to undergraduates in other universities. The highly touted Withers Report expounded on the utility of the well-rounded education RMC offers all cadets; this is the basis upon which RMC's academic program continues to deliver to this day.⁴⁶

Because of its status as a university, RMC is able to support the CFC curriculum and the completion of graduate degrees in conjunction with Professional Military Education (PME) delivered during the Joint Command and Staff Program and the National Security Studies Program. RMC also offers university programs to serving officers, Non-Commissioned Members, DND employees and their spouses.

3.3. Faculty and Staff

The strength of any organization resides in its people. Supporting the ROTP and RMC's unique mandate of producing officers, the faculty and staff are a combination of civilian and military professionals who reflect a diverse, bilingual and inclusive workforce, one that is based on a culture of excellence in teaching, research, innovation and academic support. They provide for an atmosphere where students are challenged and inspired to develop the intellectual capacity to understand and contribute to the Profession of Arms; RMC's faculty and staff serve as role models for the inculcation of a military professional ethos and they motivate students to value bilingualism and physical fitness as core competencies to lead the future CAF. The education

⁴⁵ Officer General Specification

⁴⁶ RMC Board of Governors, Report to the Board of Governors by the Withers' Study Group, "Balanced Excellence: Leading Canada's Armed Forces in the New Millennium," Kingston, Department of National Defence internal document, 30 April 1998.

and mentorship afforded to RMC students reinforces duty and responsibility, while instilling critical thinking, sound personal judgment and ethics.⁴⁷

The AG commented that some academic faculty did not support class attendance and believed that "...RMC was first and foremost a university, not a unique national institution."⁴⁸ RMC understands its responsibilities as a military academy with degree granting authority, mandated to produce officers through the ROTP. RMC has re-emphasized the mandatory class attendance policy and has taken measures to underscore RMC's uniqueness during town halls, communiqués and the annual orientation seminars. RMC has also implemented an orientation seminar for new academic faculty and staff to give a better understanding of the RMC military environment and the uniqueness of RMC as a national institution. This effort will be ongoing and RMC will be leveraging every opportunity to help in this regard. Last year, some faculty and staff even gained personal insight into Officer and Naval Cadets summer training while accompanying the Commandant during a summer visit to RMC cadets undergoing phase training in Gagetown.

Since its earliest years, RMC has had a uniformed teaching presence, both in the form of Training Wing (TW) staff and Military Faculty (MilFac) members. These groups of professionals are drawn from all three environments (Army, Navy and Air Force) and possess a broad range of military backgrounds and experience levels, ensuring ethics and professionalism are worked into every lesson. It has long been recognized that the addition of serving officers to the faculty has many benefits and approximately 25% of the current professorate are MilFac members. MilFac officers necessarily possess graduate-level academic qualifications and therefore reflect a commitment to life-long higher learning. As serving military members, they exemplify the future for our students and are well positioned to mentor Officer and Naval Cadets. As uniformed scholars, they contribute to teaching pedagogy in a unique way that only experienced and serving officers can.

RMC's MilFac and TW members engage in many hours of direct contact time with students, creating substantial opportunity for cultivating both academic and professional development. With the ability to individually integrate past experiences and collectively convey the importance of the role of education and learning for the profession of arms, MilFac and TW members play a critical leadership role at RMC. This uniformed presence sets RMC apart from other Canadian universities and is fundamental for RMC to be successful in completing its primary mission of supporting the ROTP.

3.4. **Research Matters**

Research matters because it enriches the educational experience at RMC for both graduate and undergraduate programs. RMC's research activities are inspired by a culture of discovery and innovation that is inquiry-based and Defence-relevant. RMC's research activities lead to the generation, transfer and sharing of knowledge, especially that which is relevant to Defence and security. The influx of ideas and developments from research directly enhances the quality of education in the classroom. RMC has some very unique research facilities, such as a nuclear reactor, wind tunnels, an anechoic chamber, a Space observatory and a cyber lab, to name a few.

47 Inspiring Excellence: The Strategic Plan for the Academic Wing

48 Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017).

RMC professors conduct research and provide expert advice in areas such as the Defence policy, leadership and management, politics and economics, military history, cyber security, chemical, biological, radiological, nuclear, electronic warfare, space and aerospace, ammunition and engineering, infrastructure and the environment. RMC is also a founding partner with the Canadian Institute for Military and Veteran Health Research (CIMVHR).

Embracing its unique military university culture, RMC blends the military culture of leadership and duty with the academic spirit of free critical enquiry. RMC faculty members have close links with the wider Defence and security communities through research partners, collaborators and students. The international fraternity of the uniform gives our faculty access to a select worldwide network of research, education, and practical collaboration, including international military students and faculty exchanges. Military faculty and militarily relevant research enable pertinent courses with military examples in the classroom and our wide-ranging military contacts, in Canada and abroad, allow for an accessible research and teaching environment that is distinctive.⁴⁹

RMC also contributes to the broader academic, professional, Defence, whole of government and security communities. Recognized as experts in numerous fields of study, RMC faculty members serve the CAF and government of Canada through the provision of expert advice and research. Through active engagement nationally and internationally, RMC shares knowledge in research and teaching through personal contacts and publishing, being responsive to the broader public and the media in both informal and formal settings and continuing ongoing communication with collaborators as an inherent, natural part of RMC's academic environment and responsibilities as a university.⁵⁰

49 Inspiring Excellence: The Strategic Plan for the Academic Wing

50 Ibid.

4. **Strengthening Military Training**

4.1. **Revamping the Training Program**

In response to recommendations provided by the SSAV and AG, fundamental changes have been made to military training at RMC, and more improvements are in progress. As presented to SCoPA, the entire complement of military training activities was reviewed and the training program revamped to align it more closely with the CAF Leadership Development Framework. The changes include an individualized assessment process to ensure Officer and Naval Cadets receive guidance tailored to their own strengths and weaknesses, raising the ranks of key training wing personnel to provide Officer and Naval Cadets with instructors with more advanced experience and skill levels, and an elevation of the quality of coaching, mentoring and oversight.⁵¹

In addition, more military training at RMC is now conducted based on operational scenarios such as, "...conducting investigations, conducting military planning and handling subordinates in situations involving military discipline and the military justice system."⁵² Summer placements have also been reviewed such that during the summer of 2019, Officer and Naval Cadets not attending language courses or occupation training will benefit from better experiential learning. Feedback from these placements will be reviewed annually to ensure Officer and Naval Cadets receive the best contact training possible in order to enhance the RMC leadership experience.

4.2. **Military Training Staff Appointments**

In its response to the reviews, RMC identified 19 Training Wing (TW) positions to be filled by CAF members of a higher military rank, including the position of the Director of Cadets (DCdts), which was raised from Lieutenant-Colonel (or Commander) to the rank of Colonel (or Captain (Navy)). In addition, the position of TW Sergeant-Major was also up-ranked to the rank of Chief Warrant Officer. To date, 18 of the 19 positions have been filled at the newly designated higher ranks. The remaining positions will be filled at the higher rank by 31 August 2020 as part of the regular military rotation cycle. These rank elevations are already contributing to the enhancement of military leadership and training at RMC. Similarly, raising the rank of TW staff means that they also draw from a higher level of training and skills commensurate with time and experience in uniform.

In addition, RMC has revised the selection criteria for TW staff to ensure that personnel selected for these positions arrive with the necessary competencies, motivation, and experience required for employment within RMC's unique military educational environment. Selection criteria now include a CO's recommendation as well as the requirement for applicants to have command experience, requisite second language skills and physical ability, in keeping with the RMC

51 Response to recommendation 1 received on Wednesday, September 12, 2018, from the Department of National Defence, of the Committee's Forty-Sixth (46th) report entitled: "Report 6, Royal Military College of Canada—National Defence, of the Fall 2017 Reports of the Auditor General of Canada,"

https://www.ourcommons.ca/content/Committee/421/PACP/WebDoc/WD10008847/421_PACP_reldoc_PDF/PACP_DepartmentOfNationalDefence-Rec1-e.pdf, 1.

52 Ibid, 1-2.

pillars. Given the CAF goal of remaining reflective of the full spectrum of Canadian society, considerations related to all employment equity groups are taken into consideration to increase representation across all groupings, particularly gender, among TW staff. RMC will continue to monitor changes made to the rank requirement and selection process for TW staff. As part of regular practice, RMC has updated and will continue to review internal staff orientation and training programs to ensure that they remain reflective of the academic and military requirements of RMC as an institution, and can adjust to the diverse and evolving developmental needs of Officer and Naval Cadets.⁵³

4.3. Process for Officer and Naval Cadet Appointments

In November 2017, RMC implemented major changes to the selection process for appointing Officer and Naval Cadets to leadership positions. As presented to SCoPA, these changes included the introduction of key selection criteria and an enhanced involvement in the process by senior RMC leadership. The new process is merit-based and includes academic performance, military conduct, physical fitness, second language ability and performance during summer training. Given their close involvement in the training and professional development of Officer and Naval Cadets, the TW Command team is now responsible for selecting candidates for leadership positions. As part of the recent changes, the Commandant now approves the selection of all such candidates to ensure a fair and consistent interpretation of the selection criteria. While the selection process is based on overall merit and ability, consideration is given to Employment Equity groups, where possible, to ensure greater diversity among Officer and Naval Cadets selected for leadership positions.

While all Officer and Naval Cadets are required to hold a position of leadership in order to graduate, opportunities range from relatively junior leadership roles, such as organizing a sports event or a mess dinner, to more senior leadership opportunities, such as squadron or division leadership positions. The new selection process applies to both senior and junior leadership positions. However, for senior leadership positions, the emphasis is placed on ethics, performance, conduct, and leadership to ensure that Officer and Naval Cadets demonstrate the required qualifications before being appointed to these positions. In the case of junior leadership positions, the emphasis is providing opportunities for Officer and Naval Cadets to develop the skills necessary to succeed in more senior leadership opportunities.

RMC leadership has reinforced changes to the selection process by increasing the involvement of serving CAF officers and non-commissioned members as mentors to better develop leadership skills among Officer and Naval Cadets. All Officer and Naval Cadets in leadership positions are now assigned a dedicated CAF mentor to provide guidance and feedback so that they can lead confidently and well, learn from minor errors and find positive growth from the experience. RMC will continue to monitor the changes to the selection process to ensure that they are contributing to the selection of highly-qualified candidates.⁵⁴

53 Response to recommendations 2, 3, 5, 6, 7 due 31 December 2018, from the Department of National Defence, of the Committee's Forty-Sixth (46th) report entitled: "Report 6, Royal Military College of Canada–National Defence, of the Fall 2017 Reports of the Auditor General of Canada."

54 Ibid.

5. Evolving the Academic Program

5.1. Integrating and Balancing with Military Training

RMC is committed to improving the integration and balance of all activities.⁵⁵ In response to the reviews and recognizing the value-added of the four pillars, RMC has taken concrete action to ensure all four pillars are reflected not only in the RMC experience but also in the degree itself. Accordingly, the RMC Senate established the Four-Pillar Committee to determine the best way forward to achieve this aim. A number of courses of action were examined and the committee engaged widely, both internal and external to the institution. A final report was presented to Senate at the end of April 2019 and a Senate decision was made to endorse all four pillars integral to the degree delivered during the ROTP. This decision will be brought to the RMC BoG for their endorsement as well. An implementation plan is being developed and it is expected that henceforth all RMC graduates of the ROTP will be succeed in all four pillars prior to being granted the RMC degree.

Since the core curriculum is already a value-added feature of the RMC degree delivered to the ROTP, RMC has established a Core Curriculum Review Committee to ensure the RMC degree remains current, relevant and continues to respond to the needs of the Officer General Specification. The review will include participation from the professoriate to ensure validity from a pedagogical viewpoint. The work of this committee involves examining the number of courses offered, course content and sequencing. This process will take longer than the Four-Pillar review as it will involve consultation through CAF environments and military occupation advisors, while ensuring coordination between both military colleges. The committee is well into the process, but is waiting for the release of the new Officer General Specification (expected in Fall 2019) before the preliminary design will be completed. Once this has been accomplished, another consultation phase and re-design phases will follow. The goal is to have a revised and up-to-date core curriculum in place for Academic Year 2020/21.

Based on the recommendations of the SSAV and the AG, the integration and balance of the activities of the four pillars has been a primary focus for RMC and this reflected in the RMC Strategic Plan 2023. Consequently, there is better coordination of all College activities and clearer oversight by the Commandant. There are now dedicated periods for both military activities and academic activities and a new process has been implemented that requires the approval of the Commandant for exceptions where one impacts the other.

5.2. Relevance to the Profession of Arms

RMC plays a significant role in supporting the needs of the service and specifically the Defence Policy: *Strong, Secure and Engaged*, helping recruit future officers by leveraging Canada's

⁵⁵ Response to recommendation 1 received on Wednesday, September 12, 2018, from the Department of National Defence, of the Committee's Forty-Sixth (46th) report entitled: "Report 6, Royal Military College of Canada—National Defence, of the Fall 2017 Reports of the Auditor General of Canada," https://www.ourcommons.ca/content/Committee/421/PACP/WebDoc/WD10008847/421_PACP_reldoc_PDF/PACP_DepartmentOfNationalDefence-Rec1-e.pdf, 2-3.

diversity and delivering quality education that inspires the culture of leadership, respect and honour, essential for service in the CAF. The research conducted at RMC is important to support the needs of the Defence policy, with notably work with the environment, cyber security, space and aerospace, as well as military and Veteran health and well-being. RMC faculty thrive at better understanding the policy, science and engineering and the impact their research has on the human dimension of their work. Research adds to RMC's value proposition and the SSAV and AG Report have indicated that RMC must commit to improving information-sharing regarding these important contributions and achievements. In support of the Defence policy, RMC is also providing the advice necessary to help restore Collège militaire royal de Saint-Jean to a degree-granting institution, with a view to ensuring synergy between the two institutions.

RMC's response to SSAV and AG observations form the basis of the RMC Strategic Plan 2023. Included in the Plan are transformational activities such as ensuring all four pillars are reflected in the university degree and reviewing the Core Curriculum to ensure it is up-to-date. The quality of RMC's programs and its connection with the Profession of Arms are also significant to RMC's value proposition, something which professors always take to heart, regularly refreshing and updating course material and using real world examples that resonate with current issues to better prepare RMC graduates for service. For example, the tenets of both Operation Honour and *Strong, Secure and Engaged* are already embedded in Psychology and Political Science courses.

With SSAV and AG feedback, RMC's agenda for improvement includes an evolution of its academic programs with a view to enhancing relevance and ensuring that each program is meeting DND's education and research needs whilst maintaining quality and accreditation demands of the Province of Ontario and Engineer's Canada. Areas of investment already include supporting math and writing skills, Indigenous awareness, leadership and resilience, culture and communications, logistics and analytics, space and cyber security, to name a few. Included at Annex A is a reflection provided by each of RMC's academic departments articulating their degree programs on offer, how these programs connect to the Profession of Arms, and what evolutions are in process. As an example, the Department of English, Culture and Communication and the Department of French Language, Literature and Culture each deliver unique programs in their own disciplines, and both also support the core curriculum as well as other programs at RMC, preparing graduates to engage in complexity and ambiguity through critical analysis of cultural texts and contexts and through clear and logical writing. It is anticipated that these Departments will merge, improving efficiency and delivering culture and communication programs that resonate well with the Intelligence and the Public Affairs Branches. It is anticipated that this evolution will enhance the attraction of RMC for students who are pursuing these occupations.

A similar evolution is taking place in the Management Department to better support the needs of the Logistic Branch, whereby courses will be developed to meet the requirements for Chartered Professional Accountant (CPA) courses. Faculty in this Department are also supporting discussions to develop programming specific for logistics officers by including supply chain management and project management among other specialized courses. The Military Psychology and Leadership department has developed courses relevant to leadership and mental health. In the Math and Computer Science Department, efforts are underway to develop specialties in

analytics, cryptography and artificial intelligence; areas that correspond well with DND and Defence policy priorities. In the same vein, the Department of Electrical and Computer Engineering now offers courses at the undergraduate and graduate level in cyber security. RMC's Chair of Cyber Security is already in place to strengthen RMC's focus on Cyber and security studies.

As part of RMC's change agenda, the evolution of RMC's academic programs will take place progressively, with changes that will involve emerging technologies and capabilities, especially those related to the Defence policy. RMC's flexibility, however, has been quite diminished as a result of the Work Force Adjustment initiative in 2012, which saw a reduction of 54 positions at RMC, 30 of which were professors. Accordingly, RMC will be evolving the academic programs progressively by assessing positions left vacant by those retiring. To ensure there is no impact to students, RMC will continue to support vacated positions using temporary (term or sessional) employees to give RMC the time needed to consider where each position needs to be invested.

5.3. Efficiencies in Program Delivery

To ensure RMC's value proposition is reasonable, RMC's programs and processes must be as cost effective as possible. In response to the AG report, RMC has conducted a review of its programs with an eye to identify opportunities for cost efficiencies and savings, some of which have already taken effect. The following initiatives have begun:

ROTP-students in residence. RMC has optimized the utilization of the student quarters, which has resulted in an increase of approximately 10% in the ROTP student population. Increasing the student population decreases the cost per student and lowers the CAF costs associated with placing candidates in other civilian university ROTP programs.

Optimizing Class Sizes. RMC will become more efficient in course delivery by decreasing the number of course sections as well as the numbers of option/elective courses offered, which will have the effect of increasing the numbers of students per class. The effect will be to reduce the number of sessional professors required to teach these courses. RMC has already taken this action and reduced its cost for sessional professors.

Non-ROTP students. RMC has initiated a study to examine how online education can be optimized at RMC for the benefit of our students and with the goal of expanding RMC's overall student population and thereby reducing cost per student. To this end, RMC has initiated a program with the Royal Canadian Air Force to provide an academic program in support of aircrew recruited through the Continuing Education Officer Training Plan (CEOTP). RMC has also introduced a certificate program in Leadership and Management for Non-Commissioned Members (NCMs) and is connected with Veterans Affairs Canada (VAC) as one of the designated educational institutes supporting the new education and training benefit program for Veterans. In addition, RMC is working with the Logistics community to determine how to support their requirements for Chartered Professional Accountant (CPA) courses. RMC is also liaising with the CAF regarding the RMC Certificate in Chemical, Biological, Radiological and Nuclear (CBRN) for CBRN operators as part of their education and training. Each of these steps increases RMC's value and relevance to the Defence community.

Reducing Costs of Electronic Library Subscriptions. There are a number of library consortia that enable university libraries to achieve significant cost savings on electronic subscriptions. For example, the Canadian Research Knowledge Network (CRKN) and the Ontario Council of University Libraries (OCUL) are consortia that negotiate with publishers of electronic materials and offer packages to Canadian universities at rates lower than could be obtained by individual universities. RMC has historically benefitted from these lower rates as a member of both OCUL and CRKN, but changes in delegations of authorities have precluded some of these benefits. Delegating appropriate authorities to Librarians through the Defence Procurement Strategy (DPS) would ensure RMC can take advantage of the significant cost savings offered by OCUL and CRKN. CDA supports this initiative and is helping to work toward a solution that uses extant PSPC policy and enables a practice that allows for the aggregation of CAF Library demands through consortia to achieve cost savings across all CAF libraries.

Internship Program. RMC has reviewed its Internship Program, which involves RMC Cadets selected for experiential learning opportunities in Canada and internationally. This program has been very successful in enhancing the learning experience for our students and has reflected very well on RMC through the performance of the participants. To reduce costs, however, RMC suspended all internships for Winter 2019 as they were all focused internationally and therefore expensive. RMC has reviewed the Internship Program with the goal of reducing the costs dramatically. This action has resulted in immediate and continued cost savings.

6. The Value Added

6.1. Financial Model

The AG Report and SCoPA observed that the price to produce an RMC graduate is higher than that of producing university graduates for the CAF using other programs. In response, RMC has completed a financial analysis for all activities at the College. As articulated in DND's Detailed Action Plan, the overall aim of the financial analysis was to develop a tool that could be used to assess whether or not RMC's spending per student is reasonable, as compared to other Canadian academic institutions of similar size, and similar Allied military institutions, adjusted for scope.⁵⁶ This analysis has also provided information to enable the comparison of expenses for ROTP at RMC with other officer entry plans, as requested by SCoPA.⁵⁷ As outlined in the paragraphs to follow, the results are remarkable in that, while confirming the methodology employed by the AG, it demonstrates that when adjusted for size and scope, the expenses associated with producing an RMC graduate are very similar to those of other university streams.

In order to ensure a valid comparison, RMC's financial model uses the Financial Information of Universities and Colleges (FIUC).⁵⁸ This methodology has been endorsed throughout the chain of command as it is consistent with the approach taken by the AG. The primary difference in RMC's analysis is that it includes an assessment of revenue streams as well as expenditures. It should be noted that the AG "...examined expenditures for the operation of RMC, but did not examine sources of revenue."⁵⁹ By focusing on expenditures only, the AG missed the importance of revenue. Expenditures associated with externally funded activities such as research, graduate studies and distance education generate revenue at universities through grants, contracts and tuition. In addition for RMC, students in the ROTP pay for their rations and quarters (R&Q), which is also a revenue stream for RMC. Further, RMC receives funding support from the RMC Foundation. A breakdown of RMC's income for Fiscal Year (FY) 2017-18 is shown in Figure 1. The total income was \$100.2M. Donations, government and non-government grants and contracts, tuition and other fees, Federal Government grants and contract as well as other income such as R&Q are revenue streams that enable RMC to fulfill its mandate while off-setting the costs associated with these specific activities. While spending revenue generates expenditures, it is reasonable to conclude that revenue generation is as valuable to RMC as to other universities, a benefit that increases cost efficiency and enhances RMC's value proposition.

56 Detailed Action Plan for Office of the Auditor General Report Recommendations, Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017).

57 Report of the Standing Committee on Public Accounts, Report 6, Royal Military College of Canada—National Defence, of the 2017 Fall Reports of the Auditor General of Canada.

58 Financial Information of Universities and Colleges Guidelines, Canadian Association of University Business Officers.

59 Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017).

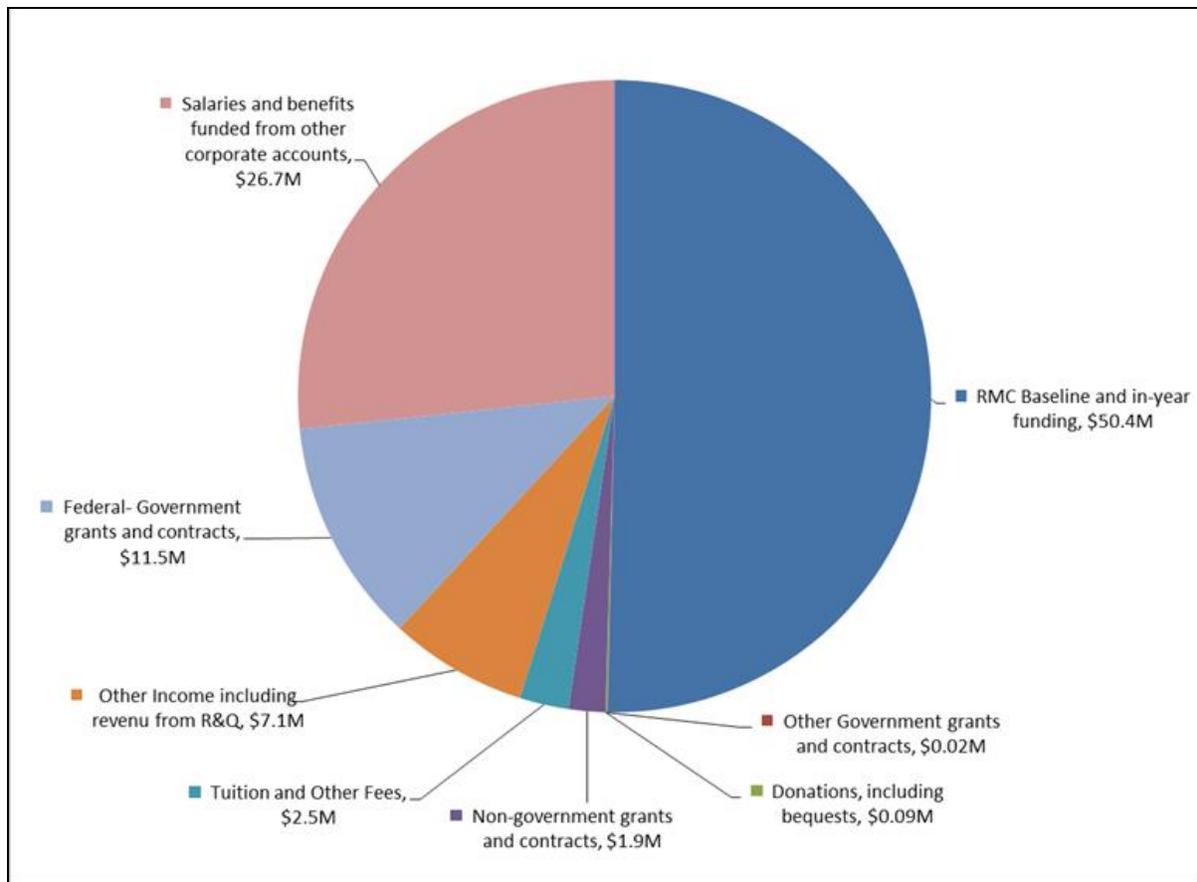


Figure 1: RMC Income for FY 2017-18

One of the goals of RMC's financial analysis was to evaluate the expenditure data reported by the AG.⁶⁰ RMC's analysis was able to confirm that the expenditure data reported by the AG was accurate.⁶¹ As did the AG, RMC used the FIUC expenditure tables to express the RMC revenue sources and operating expenses - the same methodology also employed at other universities. Expenditures were calculated using RMC Comptroller data for the FY 2017-18. FY 2017-18 was selected as it would serve as a good comparison with the AG data for FY 2014-15 and would also offer insight on more recent spending, revenue and student base. The analysis took into consideration the expenditures highlighted by the AG, including salary and wage envelope (SWE) as well as operating and maintenance (O&M) expenses.

Using estimates of time spent on teaching, research and service, the expenditure data was further broken down according to categories that included not only expenditures for the ROTP at RMC

60 Detailed Action Plan for Office of the Auditor General Report Recommendations, Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017).

61 The RMC expenditure model was within 10% of the estimated expenditures reported by the AG. It is assumed that the 10% difference is a reflection of the investments made in RMC over the past few years. This result validates the expenditure information reported by the AG and also validates the expenditure-modelling approach taken by RMC.

(program delivery in both official languages as well as military, physical fitness and second language training) but also continuing education, graduate studies and research. RMC's analysis has resulted in the development of an expenditures calculation tool that is consistent with that used by other Canadian universities. This tool will aid RMC in a detailed tracking of expenditures and costs, which will be beneficial in strategic decision-making and has provided a methodology to assess fixed costs associated with university functions. RMC's expenditure model has already benefitted strategic decision-making. For example, RMC has reworked class loads to reduce the number of sessional instructors. For the academic year starting in 2019-20, savings are estimated to be in excess of \$500K.

Referring to Figure 2, RMC's total expenses for FY 2017-18 were \$100.1M. RMC's financial model highlighted the fact that non-ROTP activities such as research, graduate studies, distance education, Canadian Army Programs (such as the Army Technical Staff Officer (ATSO) and Army Technical Warrant Officer (ATWO) programs) and other DND programs (including the Non-commissioned Member Executive Professional Development Program (NEPDP) and the Aboriginal Leadership Opportunity Year (ALOY) make up a substantial portion of RMC's expenditures. These activities, also part of RMC's mandate, support the Defence policy and contribute significantly to RMC's recognition as an accredited degree granting institution of excellence. The expenditures associated with these activities as well as support and services are included in the total expenditures at RMC and there is certainly overlap in how these expenditures impact the ROTP at RMC. Nevertheless, the expenditure model highlighted the fact that investments in delivering the ROTP program at RMC (\$32.7M) plus the expenses for support and services (\$22.6M) are still just over half of the total \$100.1M expenditures for RMC.

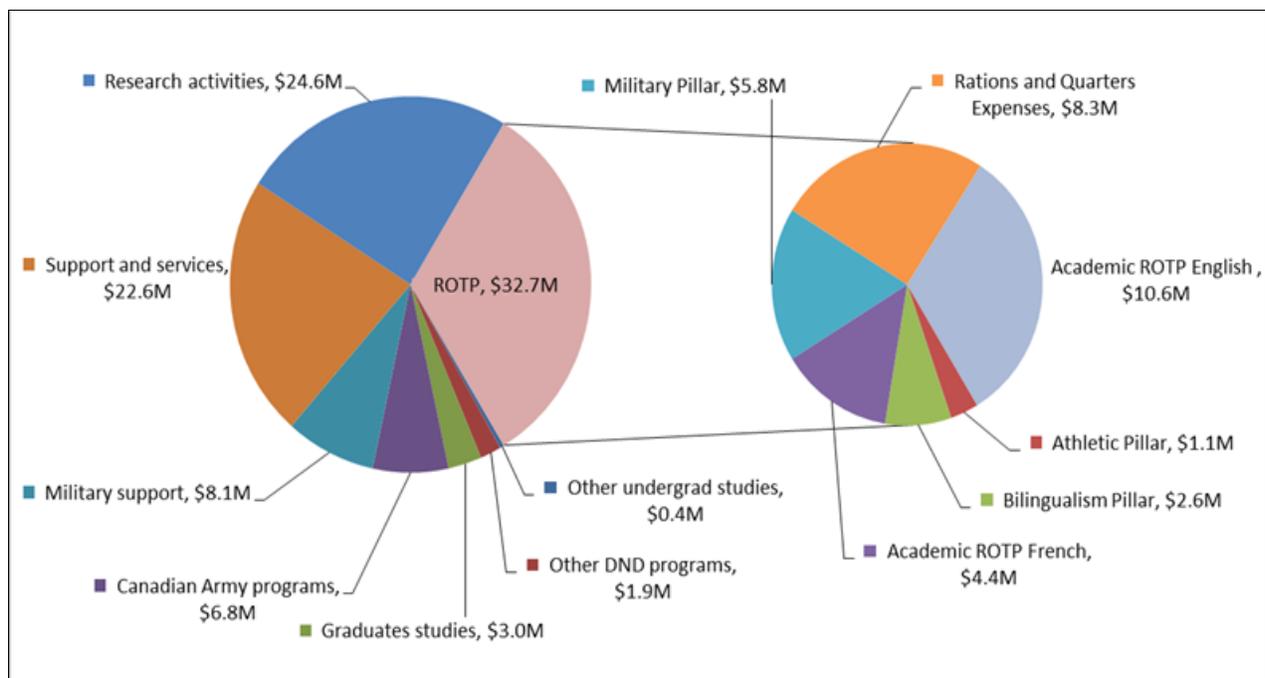


Figure 2: RMC Expenditures by activity

6.2. Comparisons

Comparing RMC with other Canadian Academic Institutions

In its response to the AG, DND committed to comparing the cost of RMC to the cost of other Canadian universities of comparable scope and size.⁶² The effects of size and scope on university expenditures have been extensively studied and suggest that economies of scale are important factors to take into consideration, especially for small universities.⁶³ The approach used by the AG was to compare total expenditures divided by the number of Full-Time-Equivalent (FTE)-students. There is concern that this methodology has practical limitations when comparing expenditures from one institution to another.⁶⁴ With this in mind, RMC has taken the AG's methodology but included a much larger sample size to analyze expenditure data across a larger number of civilian universities.

In analyzing the relationship between expenditures and student population, data for 19 provincially-funded universities in Ontario were obtained from the Common University Data Ontario (CUDO) database.⁶⁵ These comprise all universities represented by the Council of Ontario Universities with the exception of Algoma for which data were not available. DND's initial assessment, as reported to SCoPA, compared RMC to four selected universities, three of which are located outside the Province of Ontario.⁶⁶ This preliminary assessment was problematic, however, because of the small sample size and because there is no university in Canada comparable to RMC, delivering a four-pillar program with degrees in the Arts, Science and Engineering, in both official languages, and with a core curriculum that makes up 30% of the degree that is connected directly to the Profession of Arms. Given that RMC operates in Ontario, universities in Ontario do offer a reasonable list of comparators as long as they are adjusted for size and scope.

Shown in Figure 3 are the total expenditures for the 19 other universities in Ontario as a function of the number of FTE-students using the CUDO data.⁶⁷ The RMC expenditure and FTE-student data (obtained directly from the AG report) are also shown for comparison. It is important to note that RMC data were not included in the curve fitting process. The dotted line shown in Figure 3 defines the relationship between total expenditures and number of FTE-students for

62 Detailed Action Plan for Office of the Auditor General Report Recommendations, Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017).

63 Brinkman, P.T., Leslie, L.L., "Economies of Scale in Higher Education: Sixty Years of Research," *The Review of Higher Education*; Fall 1986; 10, 1; Koshal, R.K., Koshal, M., "Economies of scale and scope in higher education: a case of comprehensive universities," *Economics of Education Review* 18 (1999) 269–277; Rajindar K. Koshal & Manjulika Koshal (1995) *Quality and economies of scale in higher education*, *Applied Economics*, 27:8, 773-778, DOI: 10.1080/00036849500000068, online at <https://doi.org/10.1080/00036849500000068>

64 Financial Information of Universities and Colleges Guidelines, Canadian Association of University Business Officers, 2014/15, page 2.

65 Common University Data Ontario (CUDO) website, <https://cudo.ouac.on.ca/>

66 Response to recommendations 2, 3, 5, 6, 7 due 31 December 2018, from the Department of National Defence, of the Committee's Forty-Sixth (46th) report entitled: "Report 6, Royal Military College of Canada–National Defence, of the Fall 2017 Reports of the Auditor General of Canada."

67 Student population is represented by the number of FTE-students, calculated using the methodology presented in the AG report where "...3.5 part-time students are equivalent to 1 full-time student." Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017).

universities in Ontario. With the inclusion of a much larger sample size than that presented initially by DND and used by the AG, the curve fit of the data presented in Figure 3 shows that the relationship between expenditures and FTE-students is not linear.⁶⁸ Examining the RMC expenditure per student data as reported by the AG (represented by the data point entitled RMC-OAG), Figure 3 illustrates that RMC's expenditures are slightly higher but very consistent with expenditures per student for universities throughout Ontario. This analysis demonstrates that RMC's expenditures are where they are expected to be given our student base without even taking into consideration the extraordinary outputs that define RMC's expanded scope as discussed below.

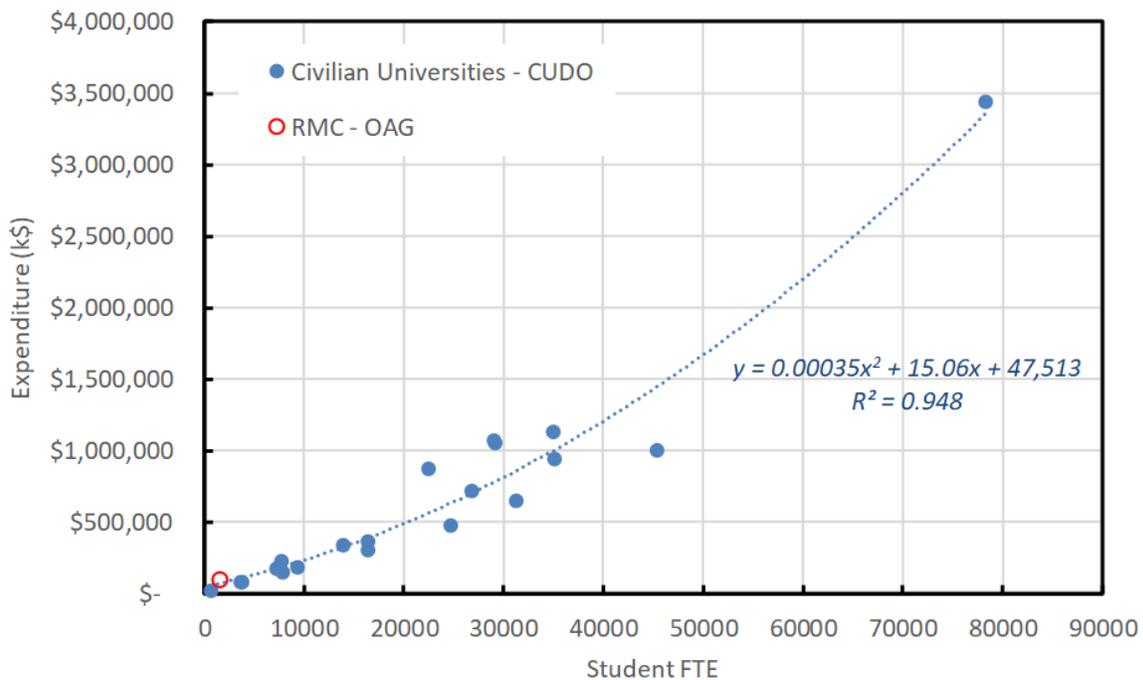


Figure 3: Expenditures for Ontario universities as a function of the number of FTE-students.⁶⁹

Adjusting for Scope

The data for RMC include all expenditures associated with activities at RMC, but some of these expenditures do not occur at any other university in Canada. These include the delivery of bilingual programs and the core curriculum, a four-year residency as well as military leadership, physical fitness and second language training, all of which significantly increase the value of the RMC graduate to the CAF. Hence, a true comparison of RMC's expenditures with those of other universities needs to be adjusted for this increased scope. The financial model developed by RMC is helpful in achieving this. To summarize, the RMC-ROTP program includes the

⁶⁸ The CUDO data fits well to a 2nd order polynomial with an R2 value of 0.95. Note that the closer the R2 value to 1.00, the better the fit of the data. An R2 value of 0.95 represents a high confidence fit.

⁶⁹ The curve represents the trend line of best fit. The data for RMC was that reported by the AG. The source of the data for all other universities was the Common University Data Ontario (CUDO) website, <https://cudo.ouac.on.ca/>

following unique expenditures:

- RMC is mandated to deliver all undergraduate programs (including arts, science and engineering) in both of Canada's official languages;
- All undergraduate programs at RMC include a core curriculum connected to the Profession of Arms that requires students to take science and humanities courses regardless of their major. This increases the requirements for teaching in the humanities and science faculties;
- All ROTP students at RMC receive daily second-language training from Language Centre instructors until a minimum proficiency threshold is achieved;
- All ROTP students at RMC take physical fitness classes given by Personnel Support Program (PSP) professionals throughout their four years at RMC, must participate in Inter-mural or Varsity sports and must pass a Physical fitness Performance Test (PPT) to be successful;
- All ROTP students at RMC undergo military leadership training and experiential learning delivered and mentored by officers and non-commissioned members of the Training Wing; and
- All ROTP students at RMC must live in residence for four years.

Table 1 presents a breakdown of RMC's expenditures for FY 2017-18, highlighting the total expenditures as well as the unique expenditures described above. Figure 4 shows the same data as Figure 3 but with a focus on those universities having enrollments less than 20,000 students to better see how RMC compares with smaller universities in Ontario. The dotted line represents the curve of best fit for the data from 19 universities as explained previously for Figure 3. The RMC-OAG data point represents the expenditure per FTE-student data reported by the AG. The RMC-FinModel data point represents the expenditure per FTE-student using the RMC financial model. Note that this data point shows an increase in students enrolled at RMC as well as the increase in expenditures resulting from the investments recommended by the SSAV. The RMC*-FinModel (with single pillar) represents the estimate from the RMC financial model adjusted for scope by removing the expenses outlined in Table 1, hence adjusting the expenditure data for RMC's increased scope, which is defined by the additional demands mandated for the ROTP at RMC. The information presented in Figure 4 illustrates that, adjusted for scope, RMC's expenditures are exactly what are to be expected for a university in Ontario. Given the previous conclusion that shows RMC's expenditures (unadjusted for scope) are already consistent with other universities in Ontario, this conclusion is a good indicator that the expenses associated with RMC's increased scope are reasonable, especially considering the value-added to the CAF.

RMC Expenditures (FY 2017-18)	
Total expenditures	\$100.1M
<i>Less Military Pillar</i>	-\$5.8 M
<i>Less Athletic Pillar</i>	-\$1.1M
<i>Less Bilingualism Pillar</i>	-\$2.6M
<i>Less Academic ROTP French</i>	-\$4.4M
<i>Less Rations and Quarters expenses</i>	-\$8.3M
Total expenses	\$77.9M

Table 1 – RMC Expenditure information

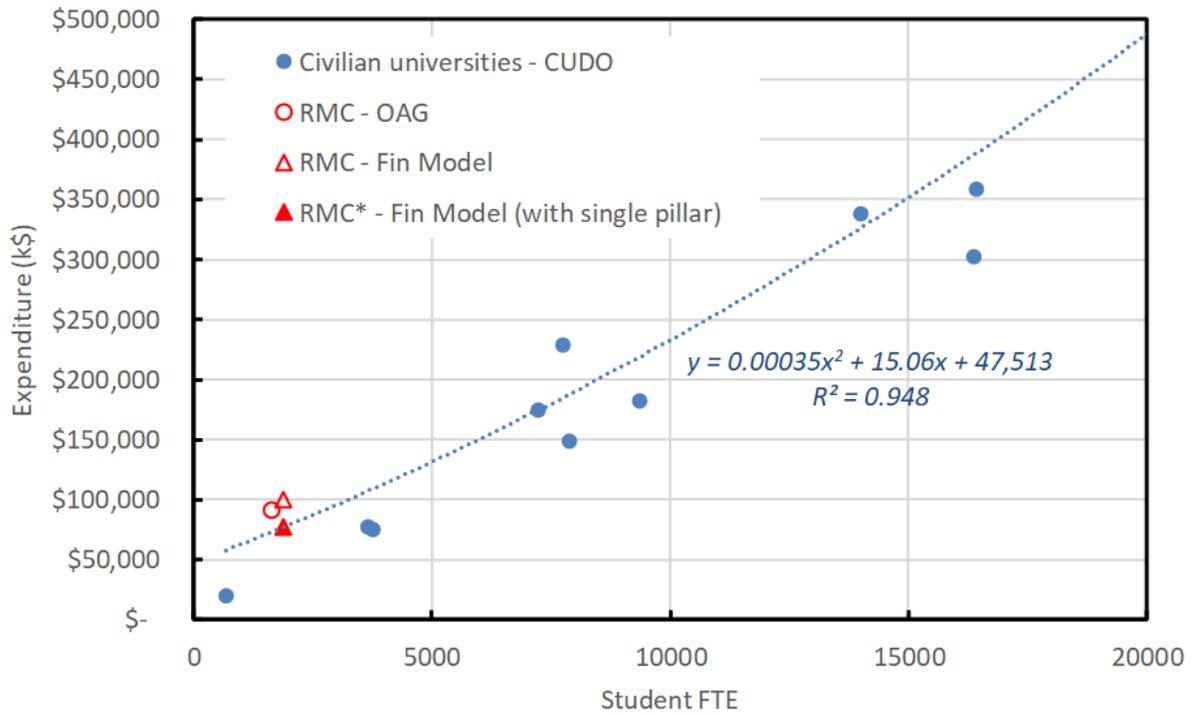


Figure 4: Expenditures for Ontario universities having an enrollment less than 20,000 as a function of the number of FTE-students.⁷⁰

⁷⁰ The curve represents the trend line of best fit as in Figure 1. The RMC-OAG data point represents data reported by the AG. The RMC-FinModel data point represents the Expenditure-student using the RMC FinModel. The RMC-FinModel (single pillar) represents the estimate from the RMC FinModel adjusted for scope by removing expenses associated with the non-academic pillars and education delivery in both Official languages.

Adjusting for Size

The curve fit of the CUDO data presented in Figure 4 show that there is a projected intercept on the vertical axis of the fitted expenditure-student plot at approximately \$47.5M. This indicates that teaching zero students does not mean zero expenditure. These are fixed expenditures, which do not vary with student population, such as utilities and administration as well as building, laboratory and equipment maintenance and library expenses. Fixed and variable education expenses are discussed by Lueken, who also contends that "...smaller schools or districts will usually have higher short-run fixed costs per student than larger schools..."⁷¹ By taking into consideration fixed expenditures associated with universities in Ontario, a more realistic comparison can be made with RMC, adjusted for size. To normalize the variable expenditures per FTE-student across universities in Ontario, the estimated fixed expenditures of \$47.5M were first subtracted from the total expenditures of each university. This value was then divided by the number of FTE-student for each university.

The results are plotted as a histogram in Figure 5, which suggest that research intensive universities (Waterloo, Ottawa, McMaster, Queen's, Western and UofT) have the highest adjusted expenditure/student (\$25-45K/student) – likely due to their higher research costs that flow through into expenditures. RMC has an adjusted expenditure-student ratio of \$16K – right in the middle of the Ontario universities.

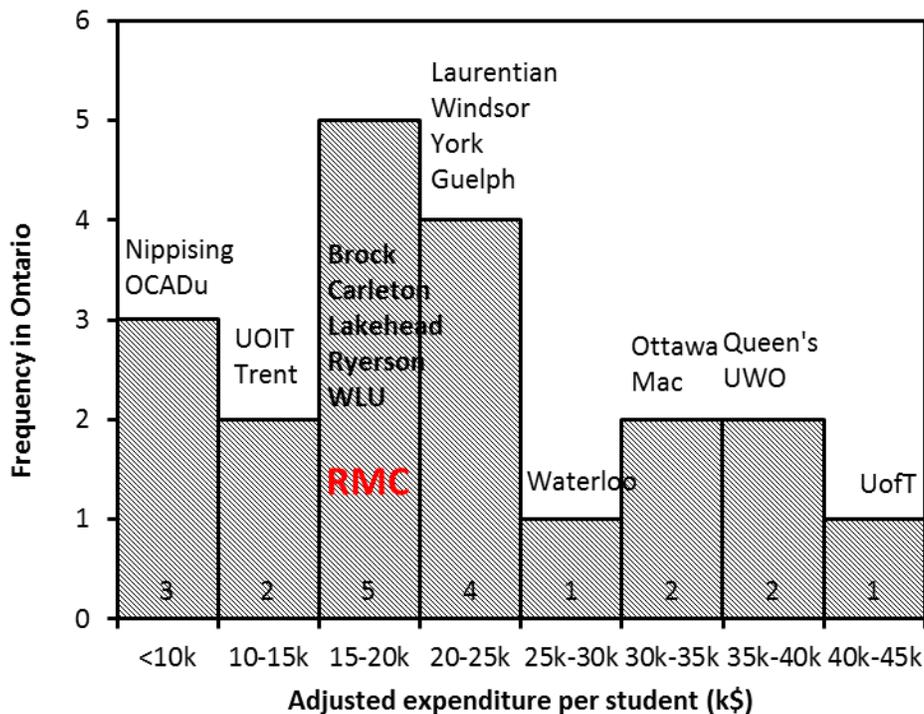


Figure 5: Frequency of adjusted expenditures per student in Ontario.

71 Lueken, M.F., "ON EDUCATIONAL COSTS: Fixed, Quasi-fixed and Variable Costs," March 26, 2017, <https://www.edchoice.org/wp-content/uploads/2017/06/2017-3-Fixed-vs-Variable-Cost-One-Pager.pdf>

Comparing the ROTP at RMC with other Officer Entry Plans

There are a variety of officer entry plans into the CAF. All are very important to officer recruitment and collectively they provide a diverse mix of educational backgrounds to benefit the CAF.⁷² A study published by CDA in 2014 concluded that “[a]ll plans are viable and contribute to the operational effectiveness of the CAF.”⁷³

In response to the AG and SCoPA, DND has committed to comparing the ROTP at RMC with other officer entry plans.⁷⁴ Other officer entry plans examined include: ROTP at civilian universities (ROTP - Civ U), Direct Entry Officer (DEO) for candidates already holding a university degree, and the Continuing Education Officer Training Plan (CEOTP) for candidates without a degree but who are required to complete a degree in a defined period of time while carrying out their regular military duties. A variation of the latter program is the CEOTP-Air Environmental Affiliated Degree (AEAD), which is in place at Seneca College. This program requires candidates to obtain a Bachelor degree in Aviation Technology while qualifying as an RCAF pilot over a four-year period.⁷⁵ RMC’s analysis focused on ROTP-CivU and CEOTP-AEAD since for the DEO plan, the cost of education is borne by the applicant. It should be noted, however, that officers enrolling under the DEO entry plan are recruited at a higher wage and those not bilingual undertake language training while receiving a higher wage than RMC-ROTP students.

The information provided in Table 2 shows a comparison of estimated expenditures for the ROTP at RMC with those estimated for the other two entry plans. The cost of salaries and benefits is a common factor in each entry plan.⁷⁶ The total listed for RMC is that presented by the AG and the totals calculated for the other entry plans account for the expenditures using Statistics Canada data from a document that was produced in 2017 for universities across Canada for 2014-15.⁷⁷ This publication was likely not available to the AG at the time of the audit. As outlined in this document, the average annual expenditures in 2014/2015 for educational institutions across Canada that delivered Bachelor, Master and Doctorate degrees and their equivalents was \$31,652 per student. Added to these expenses for ROTP - Civ U are the program support expenses (estimated at \$1571 per student) for a total estimate of \$33,223 per student for ROTP - Civ U. Although not estimated in this comparison, those officers who are not bilingual and recruited under commissioning plans other than RMC would be required to

72 Canadian Armed Forces Professional Development System Study Final Report, Canadian Defence Academy, 16 December 2014, pg 45.

73 Canadian Armed Forces Professional Development System Study Final Report, Canadian Defence Academy, 16 December 2014

74 Report of the Standing Committee on Public Accounts, Report 6, Royal Military College of Canada—National Defence, of the 2017 Fall Reports of the Auditor General of Canada.

75 In the first year of this program, candidates complete Basic Military Officer Training, followed by Phase 1 Military Flying Training. In their second year, successful candidates move into the academic phase at Seneca College. During the remaining two years of this programme, candidates complete their military flying training and the remainder of their studies at Seneca College.

76 Estimates for salaries and benefits were obtained using the National Defence Cost Factors Manual for 2014/15

77 Education Indicators in Canada: An International Perspective 2017, online at <https://www150.statcan.gc.ca/n1/pub/81-604-x/2017001/t/tblb1.1.1-eng.htm>

undertake language training, the cost of which needs to be taken into consideration as do the elevated salaries paid since the commissioned officers are of higher rank than Officer and Naval Cadets at RMC.

Expenditures (Using AG data and data from 2014/15)			
Plan	Salary & Benefits	Education	Total
ROTP - RMC	\$52,300	\$48,522 ⁷⁸	\$100,822
ROTP - Civ U	\$52,300	\$33,223 ⁷⁹	\$ 85,523
CEOTP - AEAD	\$52,300	\$47,800 ⁸⁰	\$100,100

Table 2. Comparing ROTP at RMC with Other Entry Plans

It can be seen from Table 2 that the total expenditures per student for ROTP at RMC are higher than those at civilian universities across Canada. While the expenditures for ROTP at RMC are mostly paid by DND, it must be noted that many of these expenditures are revenue (such as funds external to RMC and DND), which mitigate the actual cost of the RMC program. As discussed earlier, the RMC program also delivers more with degree programs in the Arts, Science and Engineering delivered in both official languages, a core curriculum that is connected directly to the Profession of Arms, as well as a four-pillar program that includes: Military, Academics, Physical Fitness and Bilingualism. Therefore, while RMC may expend more on the ROTP program than other Canadian universities, RMC is mandated with an enhanced scope to deliver more.⁸¹

Comparing RMC with Allied Military Institutions

Unlike civilian universities, the goal of military academies is to produce officers, leaders engrained with a sense of duty and loyalty, with a military ethos and uncompromising ethics, leaders ready and prepared to serve the nation. Values such as respect, discipline, honour, integrity and the acceptance of unlimited liability are essential to be learned and upheld by those joining the armed forces. Students entering a military academy begin a profession that focusses on developing them as leaders with the mental and physical abilities to make decisions under demanding circumstances. RMC has much in common with other Allied military institutions since they share the same mandate of producing officers fit to excel in service. The information presented in Table 3 shows a comparison of RMC with the United States Naval Academy

78 Based on \$55,000 of expenditures calculated by the AG minus the amount paid by each RMC cadet for rations and quarters.

79 Civilian university education expenditures reported by Statistics Canada for 2014/15 were \$31,652. In addition, students can expect to pay approximately \$796 per year for books (Maclean's Magazine survey of Canadian university expenses (Dec 2017)). Finally, ROTP - Civ U students are entitled annually to \$125 in pens, paper and stationary and reimbursement of mandatory fees and miscellaneous expenses estimated at \$650 annually. Hence education expenses under the ROTP - Civ U are estimated as: \$31,652 + \$1571 = \$33,223.

80 Estimate provided by Canadian Defence Academy Headquarters

81 Kowal, H.J., "The Royal Military College of Canada: Responding to the Call for Change," Security and Defence Quarterly 2019; 25(3), p <https://securityanddefence.pl/>.

(USNA), United States Military Academy (USMA: West Point), and United States Air Force Academy (USAFA).

It can be seen in Table 3 that there is a greater student population associated with US Military Academies than at RMC; however, the faculty-to-student ratio is similar, notwithstanding that RMC delivers parallel programs in both official languages that limit the economies of scale available. In addition, RMC delivers graduate studies, which are not available at these US Military Academies. It should also be noted that all military academies assessed have military training and fitness programs as well as a core curriculum connected to the Profession of Arms; these are all fundamental to the mandate of military academies. Consistent with the preliminary assessment provided by DND in the Detail Action Plan,⁸² RMC's expenditure per student as expressed by the AG is indeed significantly lower than those estimated for the Allied Military Academies assessed.

Military Academy	Founded	# Students	Student/Faculty	Op Budget (US Funds)	Op Budget in (CDN Funds)	Annual expense per student (CDN Funds)
USNA	1845	4511	9.0:1	\$409M	\$546M	\$121K
USMA	1802	4414	7.0:1	\$509M	\$681M	\$154K
USAFA	1954	3942	8.0:1	\$465M	\$621M	\$158K
RMC*	1876	1668	8.7:1		\$ 92M	\$ 55K

* Note that the source of data is that reported by the AG.

Table 3. Comparing RMC with Allied Military Academies⁸³

6.3. The Benefit of the RMC-ROTP Program

As outlined in the Detailed Action Plan, DND has completed "...a detailed analysis on Military College graduation and career development to demonstrate the value of the ROTP at RMC."⁸⁴ In

82 Detailed Action Plan for Office of the Auditor General Report Recommendations, Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017).

83 The data for RMC is that presented by the AG. US Data was derived from Forbes and US News College ranking systems. Estimates for financial data were determined using the US GAO Report to the House of Representatives, September 2003 GAO-03-1000 and adjusted for inflation. The GAO report published in 2003 used figures from FY 2002. The US FY ends in Oct, accordingly, the Op Budgets were adjusted to 2018 rates using 2002 as the base year. The average annual inflation rate over this period was 2.11% Actual rates used can be found in the table below. Inflation rate data was sourced from the US Bureau of Labor Statistics. The Op Budget data is represented in CDN dollars using an exchange rate of 1.3366. The Exchange rate used was sourced from Morningstar and reflects the current rate at 29 Mar 19 at 1428hrs.

84 Detailed Action Plan for Office of the Auditor General Report Recommendations, Fall Reports of the Auditor General of Canada to the Parliament of Canada. (2017). [Report 6—Royal Military College of Canada—National](#)

support of this commitment, the Director General Military Personnel Research and Analysis (DGMPRA) branch conducted a scientific study to examine the careers of serving officers and to draw conclusions regarding entry plans. The analysis was aimed at gaining a better understanding of the key factors that influence career progression for senior officers in the CAF to explore the differences between graduates of the CMC and those of other entry plans. Metrics examined included years of service, rank, second language competency, staff college qualifications, command appointments and attrition. The study demonstrated that graduating from a CMC has many benefits, including:

- faster career progression;
- lower attrition; and
- higher representation at senior ranks of Lieutenant-Colonel (Commander) and above.

The study further concluded that RMC's four-pillar program was effective in helping prepare graduates for service, emphasizing the significant value of practical military leadership training and early second language proficiencies were felt to be of significant value.⁸⁵ The observation regarding second language training was also highlighted in the 2014 Study on Professional Development in the CAF, stating that "...RMC officers graduate with a SOL [Second Official Language] profile of at least BBB giving them a significant linguistic advantage over officers from other entry plans."⁸⁶ The DGMPRA also study showed that with data current as of December 2017, disproportionately higher percentages of women and Francophones in the CAF officer corps are CMC graduates as compared to ROTP (Civ-U), DEO, CEOTP and OCTP. This highlights the value of attraction that RMC provides in recruiting women and Francophones into the CAF.⁸⁷ Another benefit of the RMC education is that it provides 2 out of the 7 credits for the Canadian Forces Junior Officer Development (CFJOD)⁸⁸ program and therefore puts RMC graduates ahead of those officers recruited through other entry plans.

As demonstrated by the research, there is unquestionable value to the CAF in having future leaders immersed in a bilingual, military environment for four years of university education. It is recognized, however, that RMC would benefit from a formal validation process to allow our customers - those individuals and organizations that receive our graduates - to provide feedback on the quality of our graduates. RMC's goal is to connect with them more formally so that our programs can continue to evolve and be tailored to meet the needs of the service.

Defence, http://www.ourcommons.ca/Content/Committee/421/PACP/WebDoc/WD8148750/Action_Plans/70-DepartmentOfNationalDefence-e.pdf.

85 Department of National Defence internal document, 1150-1 (DGMPRA), "Distribution of Scientific Brief: Highlights of Studies Comparing Officers from Different Entry Plans, dated 23 November 2018.

86 Canadian Armed Forces Professional Development System Study Final Report, Canadian Defence Academy, 16 December 2014

87 Presentation by DGMPRA, "Analysis of Current Officer Population by Entry Plan," 27 February 2018.

88 Canadian Armed Forces Junior Officer Development Programme (CAFJOD), Distance Learning, Student Guide, online at http://www.dnd.ca/assets/FORCES_Internet/docs/en/training-establishments/student-guide.pdf

Overall, however, RMC is producing graduates who have been well-exposed both culturally and academically to a military ethos and who have the skill sets essential for success as leaders in the CAF. Civilian universities do not provide RMC's core curriculum that ensures a broad-based education grounded in the Profession of Arms, nor can they offer experiential learning in a military culture, together with physical fitness and second language training that ensure graduates are ready for service. Delivering undergraduate programs in the Arts, Science and Engineering in both official languages and responding to needs of the CAF, RMC is unique and produces an assured, strong, officer cohort that is invaluable to the diverse make-up of the officer corps.

RMC Academic Departments

The Faculty of Social Science and Humanities

The Department of Defence Studies

The mission of the Canadian Forces College (CFC) is to “prepare selected senior CAF officers, international military, public service and private sector leaders, for joint command and staff appointments or future strategic responsibilities within a complex global security environment.” This reflects the professional orientation of the College: while all the forms of higher education are present at CFC, its mission is focused on professional education outcomes as opposed to purely academic ones. However, given a “complex global security environment,” this mission has itself become increasingly complex in terms of providing professionals the context they need in order to prepare for that which cannot be predicted. In 1998, Dr. Paul T. Mitchell was hired as the Deputy Director of Academics by the College to provide academic oversight for CFC programs of study. Over the next two decades, 12 other academics have joined him in Toronto, revolutionizing the provision of professional military education (PME) in order to address this challenging educational space.

Degree Programs

In 2002, CFC created the “Directorate of Academics” (DAcad) to manage the growing number of UTs working at CFC. Shortly thereafter, collaborative work between CFC and RMC, overseen by the Inter-Collegiate Committee, led to the establishment of the Masters of Defence Studies, and ultimately to the creation of the Department of Defence Studies (DDS). The Department of Defence Studies is a fully embedded department of RMC within CFC, which supports the delivery of the MDS. DACad is a directorate of CFC which supports the delivery of graduate level PME, as mandated by CANFORGENs 064/08 and 106/08. This hybrid organization looks in two inseparable directions at once, both professional and academic. As the brief organizational history above suggests, the intersection of academic and professional education in the form of RMC degrees and CFC PME qualifications is a complicated affair. While each organization prefers to keep the distinctions carefully separated, CFC PME programs overlap considerably with RMC degree programs. This is reflected in the internal organization of UTs at CFC.

There are important distinctions between the Director of Academics and the Head of Defence Studies, each of which is assigned to a different UT. The Director, also referred to as DACad, is a pure CFC position, whereas the Head is a pure RMC position. DACad serves as the academic advisor to the Commandant and senior CFC staff. DACad also serves as the PME academic advisor to the Commander Canadian Defence Academy (CDA). The Head serves as any other RMC Head of Department, with similar responsibilities and accountabilities to the Dean of Social Sciences and Humanities.⁸⁹ Effectively, DACad oversees programmatic design and

⁸⁹ Between 2013 and 2016, the Director was also the “Associate Dean of Arts (CFC)” for RMC. However, this created an awkward organizational interface between the Principal’s office (with whom the Director of Academics needs to work) and the then Dean of Arts. As such, the Director and the Dean of Arts jointly decided to eliminate the position in 2016.

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To RMC Response to AG

delivery, strategic leadership of CFC academics, and external outreach to the CAF, other foreign PME institutions, and other academic institutions.

Impact and Connection to the Profession of Arms

The complicated relationship is also reflected in CFC/RMC academic programs. The Masters of Defence Studies (MDS) degree is a professionally based master's degree founded on the curriculum of the Joint Command and Staff Program (JCSP). The MDS is only delivered to qualified JCSP students admitted to that program. The National Security Program (NSP), composed of CAF and International military students at the rank of Colonel, and senior Canadian public service executives from security related departments and agencies (typically at an EX-01 or EX-02 level) has also been accredited against the RMC Masters of Public Administration (MPA) degree. Like the MDS, students have to apply and be admitted to the MPA program following admission to the NSP. Finally, the Canadian Security Studies Program is a non-degreed two-week seminar on national security delivered to middle management military officers and federal public service personnel.

However, in class room terms, DDS UTs deliver education to all residential students at CFC irrespective of their enrollment in degree programs. Further, because RMC accreditation is based on the CFC developed program curricula (rather than separate and distinct courses)⁹⁰, what distinguishes students in the class room is less the course content, but rather the depth and rigor of their assigned work and its assessment. Students pursuing degrees are judged against academic assessment criteria specifying deeper levels of research, and more exposure to the academic literature; students pursuing purely professional outcomes are judged against professional assessment criteria, which focus more on practical expression of professional thought. However, each stream is delivered against the criteria of “graduate level education”. Given a complex global security environment, it is professionally essential to deliver PME with the same degree learning expectations as outlined in OCAV's Graduate Degree Learning Expectations.⁹¹ PME students need to understand their own military frames of reference, appreciate other professional and informal frames of reference, and develop the intellectual autonomy to step outside them if they are to effectively engage with the complex scenarios confronting military professionals in the contemporary operational environment. Given these requirements, DDS is unlike any other RMC department in its essential multidisciplinary. The 13 UTs employed at CFC come from six different academic disciplines. Furthermore, their teaching at CFC has taken many of them far from their initial disciplinary identities in terms of their own professional research.

Program Evolution

Since 1998, the JCSP has undergone two significant academic evolutions. The senior officer

⁹⁰ MDS students are given the option of a research paper or an “Internship” stream that is not offered to JCSP students; NSP MPA students must take an economics course as well as complete a Directed Research Project, which is not part of that programme's curricula.

⁹¹ Appendix 1: OCAV's Undergraduate and Graduate Degree Level Expectations, <https://oucqa.ca/framework/appendix-1/>, accessed 11 June 2019.

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programs were only introduced to CFC in 1998, but have undergone only one significant evolution. Given the professional nature of all CFC programs, however, course content reflects greater year to year “dynamics” than typical university courses. Most courses are up-dated on a yearly basis, beyond typical revisions to reading lists. In 1998, under the pressure of the Young Report,⁹² CFC’s program was evolving from a typical PME program entirely under the control of the CAF, to a more open design shared between academics and military. The introduction of the MDS completed this shift, requiring oversight by RMC’s Graduate Studies Committee and periodic accreditation review under, first the OCGS, and then the RMC Institutional Quality Assessment Program criteria. This led to the creation of teaching departments in which the responsibilities for course design was shared between military curriculum development officers and RMC UTs and jointly overseen by the CFC military “Director of Programs” and the DAcad.

Initially, the MDS was purely a research based degree, requiring a 10,000 to 20,000 word directed research paper to complete the degree. However, it became increasingly difficult to oversee the number of research papers as the JCSP yearly cohort expanded from 90 students to its current level of 128 in the early 2000s. Further, MDS enrollment went from roughly 60% of the cohort to 95% currently. When a distance learning version of the JCSP was introduced in 2008, the number of students became impossible to manage, even using external academics from other universities across Canada. The normal practice of restricting enrollment to the program was not a suitable solution to this resource problem as the promotion scoring structures in CAF career management prioritize those with a Master’s degree, and career time pressure makes it very difficult to complete outside of the year spent in Toronto. In 2013, a course based version of the JCSP was introduced, partly in response to this problem (and at the request of the then RMC Dean of Arts, Jane Errington). This permitted greater academic choice for JCSP students to pursue “non-core” studies in terms of electives, as well as three different streams from which they could choose to specialize.⁹³ The streams have both a strong practical focus in a concluding exercise organized around a complex practical problem, as well as a shorter research paper of 5000 words.

Senior level PME was initially organized around two separate courses: a three-month Advanced Military Studies Program which focused on operational art, campaign design, and the command and leadership of such affairs, as well as a six-month National Security Studies Program, oriented around strategic studies and executive level institutional leadership. These programmes were combined into the NSP in 2008, at which point the program was accredited against the MPA. Both programs continue to evolve in response to the operational environment. In particular, the role of “Design Thinking” has become central to both programs in order to assist military officers with the task of working in “Volatile, Uncertain, Complex, and Ambiguous” environments. Further, the interaction between CFC programs and CAF/Government of Canada organizations grows yearly, firmly situating CFC education within a solid professional context.

⁹² Young, Douglas. *Report to the Prime Minister on the leadership and management of the Canadian Forces*, Ottawa: Department of National Defence, 1996.

⁹³ Students can choose to specialize in Defence and Security Studies, Institutional Policy Studies, or Advanced Joint Warfare Studies in the streams.

RMC Academic Departments

The Faculty of Social Science and Humanities

The Department of English, Culture, and Communication

Degree Programs

As articulated in the Defence Policy *Strong, Secure, Engaged (SSE)*, officers in the Canadian Armed Forces (CAF) must be familiar with a diversity of cultures, conversant with transnational culture and “guided by values of inclusion, compassion, accountable governance, and respect for diversity and human rights.”⁹⁴ Graduates from English, Culture, and Communication (ECC) programs are well-prepared for these expectations, learning to engage in a complex and ambiguous world through critical analysis of cultural texts and contexts and through clear and logical writing. The ECC department currently offers an undergraduate degree in Arts with courses in English studies, Culture and Communication. It also provides a popular Minor program that supplements other degree programs at RMC. The department also delivers courses within the Military and Strategic Studies (MSS) undergraduate program and the War Studies (WS) graduate program, as well as a wide range of distance education courses through the Division of Continuing Studies (DCS). In addition, ECC is a major provider of courses in the core curriculum, delivering four of the mandatory credits in the Regular Officer Training Plan (ROTP).

Impact and Connection to the Profession of Arms

Courses delivered by ECC align with the faculty’s expertise in communications and culture. The first-year courses, for example, introduce students to textual and cultural analysis, critical thinking, and analytical writing. In addition, the second-year course *Reading the Contemporary World*, which is mandatory for all Social Sciences and Humanities students, develops these skills in the context of conflict, which is often predicated on real and perceived differences in nationality, race, ethnicity, politics, religion, gender, and sexuality. Such cultural forces underpin the conflicts in which modern soldiers operate. As the course description explains,

This course develops students’ cultural literacy in a global context through critical examinations of modern and contemporary texts. Students will apply critical and cultural theories to a range of texts and topics that address questions concerning global cultures in the 20th and 21st centuries. Students will also apply research methods to the composition of argumentative essays.⁹⁵

The success of RMC’s core curriculum derives from the fact that it is supported by robust programs that attract and retain professors with active research profiles. Without full programs

⁹⁴ *Strong, Secure, Engaged*, 61, online at <http://dgpapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf>.

⁹⁵ RMC Academic Calendar, online at <https://www.rmc-cmr.ca/en/registrars-office/undergraduate-english-culture-communication-courses#ene210>.

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supporting productive research professors, the core curriculum will degrade. The ECC programs are taught by exceptional researchers with international reputations, distinguished publication records, a strong history of teaching and service awards, and successful applications for external research funds. The program has a long and effective record of producing officers well-equipped to meet the needs of the CAF. The proposed changes will strengthen that contribution and help to ensure that RMC produces the kind of officer that no other post-secondary environment can provide.

Program Evolution

The ECC department is well-positioned to evolve its program to address the needs of officers in ways that could not be achieved in another university environment. The shared long-term vision with the department of French, Literature, and Culture is to evolve both departments into a single Culture and Communication department that will better serve the needs of the CAF and will be particularly beneficial to the Public Affairs and Intelligence Branches.

As part of this evolution, ECC will focus on global cultures, cultural studies, and communication. Our courses will foster a sophisticated awareness of the ways in which cultures – and the ideologies that sustain them – are shaped, maintained, and influenced. This knowledge leads to what Brigadier-General Charles Lemieux referred to as “cultural interoperability,” a core capability that emerged from his research on the needs of the future soldier.⁹⁶ Equally committed to education in communications, we are developing key courses toward establishing a Communications Minor. This evolution will occur over time while ECC continues to maintain Majors and Honours degrees that meet quality standards of the Canadian university community. ECC’s evolution will involve the following priorities:

- ✚ Leveraging the faculty’s expertise in culture, enabling ECC to contribute to the evolving needs of the CAF. The study of the cultures and literatures of different national, social, historical, economic, ethnic, environmental, and political milieux fosters flexible and dynamic minds capable of adapting to unfamiliar ways of thinking and communicating across divergent cultural expectations. The program’s interest in questions of diversity (SSE 22) at home and abroad will help prepare officers to meet the needs of those they lead and serve. Furthermore, the study of changing media and modes of communication will address the ways in which “[s]ocial media and smart technology have transformed every aspect of daily life” (SSE 49) across a global landscape characterized by conflicts linked to collisions of cultural identity.

⁹⁶ BGen Charles Lemieux, “Articulating the Vision of the Canadian Officer Corps of 2020: Understanding the Leadership and Ethical Challenges,” *Canadian Military Journal*, 3.1 (Spring 2002): 34. Lemieux writes, “The majority of officers surveyed rated a lack of knowledge and understanding of the culture in which they were operating as their greatest deficiency. This cultural dimension applies not only to effective interpersonal relations with the local population, but also with other military forces and organizations. ‘Cultural interoperability’, as opposed to technical interoperability, with other countries’ armed forces and agencies may be one of the major challenges of the future. Patience, social understanding and tolerance for cultural differences will be essential to operational success.”

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- ✿ Establishing a Cultural Studies Minor that will serve as the basis for developing the longer term evolution to the new Culture and Communication focus. This Minor will focus on global cultural intelligence, diversity, information technology, and contemporary culture. The goal for this Minor is to meet priorities outlined in SSE. This program will contribute to producing officers who are better equipped to operate “in a global security environment defined by complexity, unpredictability and instability” (SSE 8). This Minor would have as its mandate the need to address “the evolving balance of power, the changing nature of conflict, and the rapid evolution of technology” (SSE 49).
- ✿ Improving the expertise in cultural intelligence by staffing our vacant position with an expert in global culture. This area of expertise is essential for producing officers capable of providing strategic communication in a complex environment of ambiguity and risk.
- ✿ Establishing a bilingual Communications Minor that will formalize our communications expertise into a unified suite of courses. The bilingual Communications Minor will be attractive for Public Affairs Officers and will be augmented by courses in the Minor in French as a Second Language to ensure that graduates constitute some of RMC’s most bilingual cadets. Some of these courses are within the current areas of expertise of existing faculty, and some of the resources would be drawn from the potential addition of a Public Affairs Officer military faculty member.
- ✿ In anticipation of the retirement of our current military faculty professor, acquiring a suitably qualified Regular Force or Primary Reserve Officer from the Public Affairs Branch to more fully develop the military component of our anticipated expansion into the domains of communication and cultural intelligence.
- ✿ Opening more of our onsite courses to dual-delivery to allow more students to take advantage of the evolved program (completed).
- ✿ Revising our graduate courses supporting the War Studies program to create further contexts to support militarily relevant research and teaching (completed); developing courses in communications to contribute to the Masters of Business Administration (MBA) and Masters of Public Administration (MPA) programs.

Départements académiques RMC

Faculté des sciences humaines et sociales Département de langue française, littérature et culture (FLC)

Programmes d'études

Le Département a récemment changé son nom à Département de langue française, littérature et culture (FLC) pour qu'il soit plus représentatif des cours et des programmes offerts, mais aussi pour rendre plus visible la diversité des domaines de recherche des professeur-e-s. Les professeur-e-s du département FLC enseignent des cours à tous les étudiants francophones du Collège. Le département est un acteur essentiel en ce qui concerne le Tronc commun auquel il contribue 4 crédits obligatoires. Le Département FLC soutient les programmes suivants :

- 📖 Baccalauréat ès arts avec Spécialisation (20 crédits), Majeure (16 crédits) et Mineure (8 crédits) en Langue française, littérature et culture.
- 📖 Programme multidisciplinaire Études militaires et stratégiques (EMS).
- 📖 Baccalauréat ès arts et sciences militaires (BAScM) offert par la Division des études permanentes.
- 📖 Programme de deuxième et troisième cycle d'études sur la guerre.

Il faut aussi ajouter qu'en septembre 2018, le Département a lancé un programme de Mineure en français langue seconde (FLS) ouvert aux 3 Facultés et destiné à tous les étudiant-e-s ayant atteint le niveau BBB. 15 étudiant-e-s sont inscrit-e-s au programme, ce qui correspond au maximum d'inscriptions souhaitées. L'objectif est que ces dernier-ère-s atteignent le niveau CCC avant la fin de leurs études. Assurément, ce nouveau programme joue un rôle important pour affermir le pilier du bilinguisme au Collège.

L'impact et le lien avec la profession des armes

Les objectifs pédagogiques des cours offerts au Département FLC sont en lien direct avec les attentes concrètes qui pèsent sur les officiers des FAC : analyser l'information, développer un raisonnement logique et un esprit critique, améliorer ses aptitudes d'argumentation et de communication tant à l'écrit qu'à l'oral, et tenir un discours cohérent sur des situations complexes.

Au cours des dernières années, le Département a créé 5 nouveaux cours en lien direct avec la politique de défense du Canada : *Protection, sécurité, engagement*. Ces cours de nature thématique sont axés sur des questions sociopolitiques de première importance dans un monde en changement et préparent les officiers, notamment les officiers du renseignement et ceux de la logistique, aux défis auxquels ils seront confrontés. À ces nouveaux cours s'ajoutent 6 cours

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portant sur l'imaginaire de la guerre. Grâce à ceux-ci, les étudiant-e-s acquièrent de précieuses connaissances sur les mises en discours du pouvoir en relation avec une diversité de troubles sociaux (révolution, conscription, guerre, crise, récession, etc.). De plus, la question du genre et les principes qui ont guidé Opération Honour sont au cœur des recherches, des publications et des cours de 3 professeurs au Département. Plusieurs efforts ont été réalisés par les membres du Département pour sensibiliser les étudiants à la culture autochtone. En mars 2018, Pierre-Luc Landry a organisé un colloque international intitulé « Résistances : perspectives autochtones et postcoloniales / Resistance: Indigenous and Postcolonial Perspectives ». En mars 2017, une journée d'étude avait été consacrée à la littérature autochtone.

Les objectifs pédagogiques des cours et des programmes offerts au Département FLC, un des seuls départements au Collège à avoir atteint la parité en matière d'emploi, ont non seulement l'avantage de rejoindre les valeurs éthiques, morales et humanistes que prône le leadership militaire d'aujourd'hui, mais aussi de converger vers la politique de défense du Canada *Protection, Sécurité, Engagement* qui accorde une importance sans précédent à l'être humain dans toute sa complexité.

Évolution du programme

Comme le Département FLC offre une formation axée sur l'intelligence culturelle et sur la communication appliquée, il envisage une fusion avec le Département d'anglais, culture et communication (ECC) avec lequel il partage des points communs. Les programmes pourraient évoluer en un Programme conjoint de culture et communication, avec un volet anglophone et un volet francophone. Des démarches ont déjà été entreprises pour que cette vision se réalise :

-  Depuis novembre 2017, en collaboration avec le Département d'anglais, nous avons entamé les démarches pour mettre sur pied un programme de Mineure bilingue en communication appliquée qui pourrait attirer les Officiers des affaires publiques PAFO au Collège et qui propose une approche conceptuelle et instrumentale de la communication. Une dizaine de cours qui répondent aux exigences d'un tel programme sont déjà en place. Comme les PAFO doivent être bilingues, les 13 cours FLF développés dans le cadre de la Mineure FLS (voir : <https://www.rmc-cmr.ca/fr/bureau-du-secretaire-general/francais-langue-seconde>) répondent aux besoins des destinataires ciblés.
-  L'arrivée d'une professeure militaire (MILFAC) au département FLC en septembre 2019 permettra de développer une série de nouveaux cours de communication appliquée au sein des FAC. On peut notamment envisager l'élaboration de cours sur le journalisme en zone de guerre, la rédaction médiatique, l'écriture web, la culture documentaire, l'argumentation et la propagande, etc.

Bien que RMC soit le meilleur endroit pour accueillir et former les PAFO, mais aussi les officiers du renseignement, et qu'ensemble les Département ECC et FLC soient en mesure d'offrir une formation de qualité qui répond aux besoins des FAC, l'appui de la chaîne militaire est nécessaire pour assurer l'admission des PAFO au Collège et pour revisiter la question de la compatibilité des métiers.

RMC Academic Departments

The Faculty of Social Science and Humanities

The Department of History

“History ... presents to military professionals an understanding of how to think about intractable problems, how to grapple with uncertainty, and how to prepare throughout their careers for the positions of responsibility that they must inevitably assume.”⁹⁷

Williamson Murray

Canada’s most recent Defence Policy *Strong, Secure, Engaged* is firmly rooted in an understanding that the global security environment in which current and future Canadian Armed Forces (CAF) members will operate is “complex and unpredictable [and] ... marked by ... shifting balance[s] of power, the changing nature of conflict, and the rapid evolution of technology.” To succeed in such complex and unstable environments, the policy states that the future officers and NCMs of the CAF will need to be “agile, well-educat[ed], flexible, understand diversity, and develop sophisticated awareness” of the world around them.⁹⁸ The RMC History Department positions graduates for success in these demanding twenty-first century environments.

Who Are We and What do We Do?

The History Department has long had a deep and central place in the education of officer cadets at RMC. Since the College reopened at the end of the Second World War, the teaching of history has occupied a fundamental place in the curriculum for all degree programs. The 1998 Withers Report reconfirmed history’s essential role in the College curriculum when it asserted that in “an evolving security environment of unprecedented complexity and uncertainty, ... [a]ll RMC graduates must receive a broad, balanced, liberal education, incorporating both the arts and sciences, including courses on Canadian history, Canadian military history, and military strategy.”⁹⁹ Indeed, the report made clear that the complexities of modern strategy mandated a careful and detailed study of military theory and military history. As a result, all students in the Regular Officer Training Plan (ROTP) program at RMC must complete “core courses” in history: Canada (HI102/207), Introduction to Canadian Military History (HI 202/203), and Introduction to Military History and Thought (HI 270/271). In addition, the History Department also supports the following programs:

⁹⁷ Williamson Murray, “Thoughts on military history and the profession of arms,” in W. Murray & R.H Sinnreich (eds.), *The past as prologue: The importance of history to the military profession* (Cambridge, Cambridge University Press, 2006), 92.

⁹⁸ *Strong, Secure, Engaged*, online at <http://dgpapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf>.

⁹⁹ *Report of the RMC Board of Governors By the Withers' Study Group Balanced Excellence Leading Canada's Armed Forces In The New Millennium* <https://www.rmc-cmr.ca/en/college-commandants-office/academic-pillar-withers-report>.

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- 📌 Bachelor of Arts degree in History, offering a Major (16 credits), Honours specialization (20 credits) or a Minor (8 credits).
- 📌 Courses in the Military and Strategic Studies (MSS) program.
- 📌 Distance Learning (DL) courses offered through the Division of Continuing Studies (DCS).
- 📌 Courses in the Bachelor of Military Arts and Sciences (BMASc) offered through DCS.
- 📌 The War Studies program including Masters and PhD courses and fields and degrees.
- 📌 The Defence Studies program at the Canadian Forces Staff College (CFC) in Toronto.
- 📌 Continuing Education Officer Training Plan (CEOTP) – Pilot program providing a BMASc with a focus on Air Power.

This extensive service to and leadership of (particularly War Studies and MSS) the College's various academic programs means that the courses offered by the History Department and its faculty have, on average, over 1500 enrolments each year, a number unsurpassed by any other Department at the College. While the History and MSS programs are open to all MOSIDs for which an Arts Degree is acceptable, they tend to draw students from the operational officer trades (Infantry, Armour, Artillery, Pilot and Naval Warfare Officer). Because of the discipline's focus on analyzing evidence, assessing sources, and studying cultures very different from one's own, the program also meshes well with those who seek careers in the Intelligence Branch. As current doctoral student and Intelligence officer, Lieutenant-Colonel Andrew Brown states, "No academic discipline is more like the intelligence trade than History."

History and the Profession of Arms

"Some knowledge of military history is an essential part of any officer's education. It is unnecessary to labour the argument. There has been no great modern commander who has not been in some degree a student of war; and while it might be argued that changing conditions and changing weapons reduce the value of the study of the campaigns of the past, the fact remains that the fundamental problems and principles of military leadership do not change as a result of technological advances."¹⁰⁰

Colonel C.P. Stacey

As the quote from Col. Stacey notes, it is by no coincidence that RMC requires all students, regardless of program to complete a study of history, military theory, and strategy. Since their development over a century ago, military academies and staff colleges have understood that there is no substitute for history as the foundation for the study of war and conflict. The study of

100 Canada, National Defence, Directorate of History, Colonel C.P. Stacey, ed., *Introduction to the Study of Military History for Canadian Students*, 6th ed, 4th rev. (Ottawa: Directorate of Training Canadian Forces Headquarters, 1964), iii.

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history allows its practitioners to understand that the present is only superficially novel. As Clausewitz reminds us, “all wars are things of the same nature,”¹⁰¹ governed as they are by the challenges of friction, chance, and uncertainty. Thus an education in history is invaluable, not because it supplies junior officers with readily applicable “lessons learned,” but because it helps them understand that, while tactics and technology may change, many of the strategic, political, ethical, and other dilemmas they will face have been faced before by their predecessors. The hard earned and costly lessons of history we help them understand and analyze add to their “cognitive toolbox,” better preparing them for the difficult decisions of contemporary commissioned service.

Unique among Canadian universities for its extensive expertise in the fields of military and diplomatic history, the RMC History Department thus fulfills a vital function for the CAF and the wider defence and security studies community both in terms of teaching and research. Indeed, the Department is a centre of excellence in military and diplomatic history, recognized in the establishment of the Canada Research Chair in War Studies under the direction of Dr. Douglas Delaney, whose award-winning work on the military history of Canada and the British Commonwealth is nationally and internationally recognized. In addition, the Department has contributed to the writing of several official histories of the CAF and its missions abroad, including the Balkans and Afghanistan. Other faculty members are active in the field of cyber security and intelligence, and they frequently liaise with governments around the world to provide historically grounded analyses of this emerging field of research.

While understanding how soldiers and diplomats have conceived their options and actions is crucial to the education of all future officers, any history education that neglects the wider social, economic, political, and cultural contexts in which war and conflict take place will always be lacking in some way. To round out the program, the Department, therefore, offers a diverse range of courses beyond military history and theory –from “Women, War and Society,” to “The Social and Cultural History of the Atomic Age,” to “War and the Environment,” to “The Roots of Conflict in Modern Africa.” These more specialized courses enable students to link to the social, political, economic, and cultural histories of the peoples and nations they encounter in their core courses. In addition, disciplinary pedagogical approaches that emphasize extensive research, methodological precision, and clarity of presentation means history students emerge from their program of study knowing how to find information, assess its credibility, focus on what is relevant to the problem, and create coherent analyses to substantiate their perspectives.

In addition to providing a solid grounding in history and research methods, the History Department also provides another vital function to the profession of arms – the stewardship of its culture, ethos, and heritage.¹⁰² Some of this takes place in the classroom, where students have

101 Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ, 1976), 606.

102 *Officership 2020* notes that senior officers in the CAF have “broad responsibilities for the stewardship of the profession,” through the promotion of “policies and programs that sustain the health of the profession, especially in the areas of professional development, history and heritage, and military justice and discipline.” Canadian Defence Academy and the Canadian Forces Leadership Institute, *Leadership in the Canadian Forces: Conceptual Foundations*, (Ottawa: 2005), 52. Available at http://publications.gc.ca/collections/collection_2013/dn-nd/D2-313-2-2005-eng.pdf

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the opportunity to learn and reflect on the culture and traditions of the profession in general and the CAF more specifically. However, understanding the evolution of CAF values, conduct, history, and traditions is perhaps best driven home by the Department's annual Mottershead Battlefield Tour, during which students, faculty, and military staff learn lessons of leadership by walking the ground over which Canadian soldiers valiantly fought and died. Standing over the graves of fallen soldiers also etches into their very being the core ethos of the profession -- "service before self". Everyone who participates in the Tour walks away with a far more profound understanding of how the actions of Canada's soldiers helped define our nation.

Program Evolution

The History program remains healthy and external assessments have praised the considerable creativity of a small and focused program to deliver a diverse array of courses. To evolve the program, the Department will take advantage of upcoming retirements to recapture the Department's ability to teach in strategic areas such as Russia and the Far East while retaining strengths in the areas of air and naval power. While recognizing the desire to maintain our internationally recognized strengths in military and diplomatic history, we also understand the need to build on them. To that end, we have accomplished this through our last two indeterminate hires, who have ameliorated our core strengths with expertise in European History, Colonial History, African History, South Atlantic History, and Gender History. Long-standing faculty members are developing research and teaching fields focusing on China and the Arab world. Others have developed courses that focus on the impact of the environment on conflict, which will be a central issue of our time. Finally, we have also bolstered areas of research and teaching that focuses on the whole of government - the interplay of defence, diplomacy, development, and commerce - that now characterizes most modern CAF missions. Rest assured, the program is committed to evolving to meet the needs of a more diverse CAF and the globalized world in which future officers will operate.

Historically, the Department has played an important role in RMC's distance education program, but existing distance and online course offerings now require renewal. During the early 2000s, the demand created by the Officer Professional Military Education (OPME) program meant that the Department created a suite of correspondence and online courses to meet the needs of thousands of CAF and DND members going through the program. OPME was cancelled in 2012, but the History Department stands ready to revise and develop our distance and online offerings to better reflect the creativity and diversity of our residential program. Over the short term, we can improve the course offerings in the fields of air power, naval power, and modern land combat. Such changes will provide relevant learning, delivered in a flexible way (i.e. dual delivery models), to meet the educational needs of officers and NCMs in the CAF.

Conclusion:

The RMC History Department has played, and will continue to play, a strong and central role in education and professional development programs within the CAF. As a centre of excellence in the study of military and diplomatic affairs, it will continue to be an important knowledge centre that will inform and support the evolution of Canadian approaches to defence and security policy

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and activities. The Department and its faculty have in the past led the evolution of many of the College's programs, particularly in the areas of graduate and distance education, so we understand how to manage the evolution of our program to better meet needs of current and future students. As a Department, we are determined to provide RMC students with rich learning environments that will enable their future leadership in the whole of government operations characteristic of the modern strategic environment.

RMC Academic Departments
The Faculty of Social Science and Humanities
The Department of Management

Degree Programs

This department delivers a Bachelor of Arts degree with courses concentrating in Management and a corresponding Bachelors of Arts (Honours) degree. In most academic years, 35-45 students graduate with either of these degrees focusing in Management. These students leave the college with the necessary broad-based management education to analyze and synthesize disparate areas within the field to solve complex, multi-faceted problems, as required in the CAF.

For students in other programs at the college, this department offers a minor in business. The minor aspires to equip students with the foundational knowledge necessary to competently and constructively collaborate with their peers, who may have deeper or broader management knowledge, in order to solve managerial problems. In collaboration with the Division of Continuing Studies, CAF members throughout the country are also enrolled in the minor and concentration programs. RMC's Master's degree in Business Administration (MBA) is also supported primarily by the Department of Management, serving primarily mid-career officers.

Impact and the connection to the Profession of Arms

The business program instructs students to think critically, analyze and synthesize within and among the following pillars: Marketing, Human Resources, Organizational Theory, Management Science / Operations, Accounting / Finance, Strategy, and Information Management. Officers are continuously tasked with analyzing, planning, making decisions, and providing advice. Officers are de facto managers and, in practice, these tasks involve synthesis of the aforementioned pillars within the field. At RMC, only the Department of Management provides future officers with an education focused on the critical analysis and synthesis of these fields to prepare them for their future roles as managers within the CAF. Furthermore, numerous managerial case studies involving the CAF are used in classroom education. These range from procurement, maintenance operations, ammunition stockpiling, and accounting practice. Nowhere else in Canada is there a business program that competes with RMC in its use of defence management cases. Consequently, not only are our graduates prepared to take on contemporary management challenges but they are specifically well-versed in contemporary challenges within the context of the CAF.

Faculty members in the Department of Management are heavily engaged in research projects involving the CAF as well. This research, when integrated with - or supporting - classroom education, further enhances the program's relevance to the armed forces. As an example, one of our faculty members studies change management in complex bureaucratic organizations in the public sector, and investigates how the legitimacy of new roles or practices can be built during change processes. A different professor from the department studies aspects of role transitions

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affecting individual performance – a common feature of officers' careers. Other research undertaken by our faculty study fleet management and equipment management within the CAF, ammunition stockpiling, capital procurement, the values and priorities of CAF financial officers, and border security. Our students not only benefit from the use of this research in our classrooms but also as CAF members and stakeholders in the research outcomes.

Given the applied nature of a management education, our department's courses and programs help in the successful implementation of the GoC's Defence Policy: *Strong, Secure and Engaged*. More specifically, our pedagogy fosters the forward thinking expected of officers to anticipate, adapt, and act in order to respond to either internal or external threats and opportunities. Our courses in strategy and critical thinking are focused on doing this on a general basis. Our other courses are focused on addressing challenges within specific management domains. For example, accounting and finance courses foster officer cadets to become prudent fiscal stewards of public resources; and HR considers the impacts of staff turnover, transition, training programs, and recruitment and retention programs on an organization. Demand forecasting, organizational capacity, and equipment reliability are included in a variety of courses. These are among the necessary skills and knowledge required among CAF officers to best prepare the CAF for emerging challenges to its operations (e.g., life-extension projects, deferred procurement projects, recruitment challenges, information management, etc.)

Beyond the foundational courses in management, our program also delivers numerous optional courses that are well-aligned with specific officer occupations. Our accounting and supply chain management courses are often sought after by future logistics offers. Courses in ethics, law, and human resource management resonate well not only with logistics officers but also with healthcare administration and combat arms trades. Pilots and MARS officers benefit from operations management and planning courses that teach students equipment management techniques. Our information management courses are directly relatable to future signals officers.

Program Evolution

Within all of our courses, pedagogy is under continuous revision to ensure its relevance to the stakeholder community. The undergraduate program is also continuously under review internally and undertake an external quality audit every eight years. Over the next year, our program is expected to include an optional course in Fleet Management and revised strategy and critical thinking courses. These will be implemented starting in the 20/21 academic year. Our department continues to advocate for an introductory management course as part of the college core curriculum to be given to all cadets.

The Department of Management remains responsive to the evolving requirements of the CAF. In collaboration with senior officers within the Logistics branch, faculty are developing programs to facilitate the attainment of a professional designation in accounting (CPA) for financial officers. Faculty are also supporting discussions to develop programming specific for logistics officers by including supply chain management and project management among other specialized courses.

The department is very fortunate to currently be staffed with four military faculty members who

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bring a wealth of knowledge in the application of management theories within the CAF. What's more is that they also contribute to pedagogical review and revision of course content (beyond just the courses they are assigned to as instructors). Former CAF officers who have transitioned to the public service have traditionally also been members of our department and we currently include two professors having that background. Another faculty member has a background in Defence Research and Development Canada. Among a team of 16 faculty members, 7 faculty members are either serving officers, retired CAF members or have worked within DRDC. This provides a unique mix of experienced defence professionals and traditional academics, resulting in a pedagogy that is equivalently uniquely fitted to the CAF.

Our partnership with the school of Applied Military Science has successfully leveraged graduate student research examining contemporary CAF management challenges (e.g., equipment and supply chain management). These have, by extension, been included in our undergraduate programs as teaching cases. Furthermore, a recent resurgence in our thesis option has included studies in airport security (specifically, CATSA - an important defence/security partner), national security (Canada Border Services Agency) and ammunition stockpiling (supporting the Artillery regiment). This has been an incredibly meaningful pedagogical improvement that inspires our cadets and prepares them to undertake deeper analysis of defence and security problems. Again, the results of their work are leveraged in the education of other cadets through case studies used in various courses.

In collaboration with our faculty (MilFac and civilian alike) both inside and outside the department, our programs continue to be reviewed on an ongoing basis. We regularly seek the input of graduate school partners and CAF stakeholders to continuously ensure our graduates are well prepared to take on their future challenges in their studies and their future service as members of the CAF.

RMC Academic Departments

The Faculty of Social Science and Humanities

The Department of Military Psychology and Leadership

Degree Programs

The RMC Strategic Plan 2023 acknowledges RMC's history of producing outstanding and capable Officers for the CAF. The Military Psychology and Leadership (MPL) Department contributes to this effort by delivering two undergraduate degree programs: BA and BA (Honours) in Military Psychology as well as opportunities for completing a Minor in psychology or a Double Major. Additionally, three of the core curriculum courses offered by MPL are mandatory credits for all students in the ROTP.

The MPL program focuses on the application of psychology, in particular, and behavioural science, in general, to the military workplace and military operations. Focussing on military psychology, this makes us a unique undergraduate program in Canada. Furthermore, a psychology degree from RMC provides an excellent grounding for professional advancement and represents an exceptional way to develop the leadership abilities of graduates. The MPL Department coordinates the delivery of several distance education courses through the Division of Continuing Studies (DCS) and offers courses for students completing the Military and Strategic Studies (MSS) undergraduate program. MPL Professors also play a role within RMC's War Studies (WS) program by developing and delivering graduate courses.

Impact and the connection to the Profession of Arms

Officer Cadets will, first and foremost, be leaders. The MPL Department's programs and core curriculum provide a foundation based on a central set of courses in learning and understanding human behavior, ethics, and leadership linked to the promotion and development of the Profession of Arms. The core courses provide a foundation on these topics to all cadets. At the first year level, the introductory psychology course introduces all ROTP students to facets of human behaviour such as motivation, errors in judgment, working in teams, and mental health. This basic understanding helps to prepare them for their years as Commissioned Officers where they will be not only working in a team environment, but also leading subordinates in circumstances that will often be volatile, uncertain, complex and ambiguous (VUCA).

At the third year level, all RMC students undertake a course in organizational behaviour and leadership. This tackles the core of what it means to work and lead in an organizational setting, with an emphasis on military environments. Critical topics for these future Officers include values and attitudes, perceptions and judgments of others, motivation, group dynamics, leadership, values-based leadership, power, communication, conflict management, stress, organizational change, cultural and gender diversity, ethical leadership and decision-making. The course allows students to enhance their own understanding of the importance and challenges of sound moral character and leadership. Ethical leadership is a key skillset that MPL seeks to

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develop in cadets. In this course, a prominent cornerstone for understanding military leadership is in the use of the CAF Doctrine – *Leadership in the Canadian Forces: Conceptual Foundations* as well as the companion doctrinal publications on *Leading People* and *Leading the Institution*.

All fourth year students are required to complete a course in professionalism and ethics. This course is fundamental for anyone who will eventually work in a VUCA environment. Through a combination of theory, case studies and an interactive classroom approach, students learn to apply basic and intermediate ethical concepts integral to the Profession of Arms. They are encouraged to develop moral sensitivity and judgment, learn to internalize professional standards into the professional self-concept and discover how to promote an ethical leadership climate. The course also includes an immersion into concepts associated with the Profession of Arms such as the core values and beliefs of the Canadian Military Ethos that guides the behaviour of CAF members, “Just War” theory including jus ad bellum, jus in bello, the laws of armed conflict and ethical decision making. The course provides the students the opportunity to develop the deftness and resourcefulness required to overcome any obstacle they may come across as leaders in the CAF and to maintain the trust of Canadian society. Of particular note for this course, the fundamental understanding of ethics and professionalism is derived in large part from the Defence Ethics Program and *Duty With Honour: The Profession of Arms in Canada* (2009).

The MPL Department has an advantage when it comes to the professional development of RMC cadets. The development and delivery of these mandatory core courses, as well as key psychology courses required for the Major, are mostly done by the department’s five Military Faculty (MilFac) members. MPL’s MilFac are currently serving Officers within the CAF with appropriate graduate degrees and operational experience. Since these academics are typically only at RMC for three or four years, this rotation ensures an exposure for the students to military policies, processes and case studies/examples that are topical, current and relevant.

MPL faculty members work closely and conduct research with various CAF organizations that is used in the development of essential CAF programs. They are actively involved in NATO research projects. Producing research and publications of relevance to the military, such as in the domains of mental health, prejudice, leadership, emotion, and ethics, faculty bring expertise that is essential for the development of students’ knowledge and understanding of behavioural and mental processes for various facets in the military.

A Major or Honour’s degree in Psychology provides a solid foundation for officers in most non-engineering or non-medical CAF occupations such as all Combat Arms Officer occupations, as well as Pilot, Air Combat System Officer, Naval Warfare Officer, Logistics, Military Police Officer, Personnel Selection Officer, and Intelligence Officer. Courses in motivation, group dynamics, cross-cultural psychology, peace and conflict, positive psychology, emotion, stress, and advanced leadership, provide students with an empirical and a theoretical foundation to deal with the many issues that they will face as leaders. Former RMC psychology graduates have gone on to complete Masters and PhD degrees at universities throughout Canada. The intent of the Psychology Degree is to develop a common base of psychological knowledge, the ability to think critically and logically, problem-solve, and the ability to communicate effectively while gaining specific knowledge relevant to their profession.

Program Evolution

Program deliverables are constantly evolving and changing. The uniformed Personnel Selection Officers (PSOs) faculty members have experience throughout the CAF in positions on military bases where they must maintain a high-level competence and understanding for all CAF occupations. They assessed serving members for occupation transfer, enrolment at recruiting centres, commissioning from the ranks, and determined suitability to continue serving when medical, physical and mental health issues threatened to curtail careers. Some of our faculty PSOs have been researchers with Director General Military Personnel Research and Analysis (DGMPPRA) where psychological research is conducted on behalf of the whole of the CAF. Finally, some of our faculty PSOs have been deployed with operational units where they provided guidance on mental health issues and capabilities and carried out operational research. The knowledge gained by all of these activities allows the MPL department to maintain a direct line to the ongoing needs of the CAF and refine program deliverables as necessary.

One of the most critical quotes from Canada's recent Defence Policy *Strong, Secure, Engaged* is:

Collaboration with academia and other experts not only strengthens the foundation of evidence-based defence policy-making, but it will also help drive innovation and develop future thought leaders. The development of collaborative networks of academic and analytic communities across Canada will increase and broaden the diversity of the pool of experts that we can draw upon, and advance informed dialogue on complex defence and security issues.¹⁰³

We are encouraged by the presence of a policy that acknowledges the power of academic collaboration. MPL will continue to play an active collaborative role in research activities throughout Canada and the world on behalf of the CAF.

One long-term anticipated change for MPL is associated with our ongoing effort to establish a Master's program in military psychology. This is a necessary tool to continue the education of CAF Officers at even greater levels of rigour and understanding of the psychological principles associated with military service and operational requirements. The program will be of value to a wide range of military occupations, such as intelligence officers, anyone serving in operational settings or coalition activities, for instance.

In the upcoming decade we plan to focus on our strengths and extend our expertise in areas related to leadership and mental health. We have recently submitted new courses for the War Studies program on topics of leadership, peace and conflict, emotional systems involved in warfare, and cognitive performance in operational and dynamic environments. We plan to offer them in the next few years. We also hope to staff two future retirements with experts in the domains of mental health, leadership, or cross-cultural psychology. This will broaden the expertise available to cadets as well as the CAF in the key domains of leadership, cultural differences relevant to military operations, and resilience-training.

¹⁰³ *Strong, Secure, Engaged*, online at <http://dgpapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf>, p. 67.

RMC Academic Departments

The Faculty of Social Science and Humanities

The Department of Political Science and Economics

Degree Programs

The Department of Political Science and Economics is very closely aligned with the basic aims of Canada's new Defence Policy *Strong, Secure, Engaged*. Our suite of courses, programs, and scholarly expertise directly address each of these three components, equipping students with knowledge of both the political and economic context within Canada, North America and the rest of the world. Graduates from Political Science and Economics programs are extremely well-prepared to engage with the complexities of a 21st century national and global environment. Our programs build analytical and communication skills, sophisticated understanding of cultural diversity, and the flexibility to adapt to unstable and changing technologies, power balances and conflicts.

Impact and Connection to the Profession of Arms

For future officers in the Canadian Forces to be successful, they require a solid understanding of political systems and economic constraints that shape the environments in which they will serve, as well as oral and written communication skills, and analytical and technical rigour. The Department currently offers undergraduate degrees in both Political Science and Economics disciplines, and helps support a range of other joint degree programs. Building on a pillar of six foundation courses, the department's courses in political science divide into three subsets:

- 🏛️ On Canada, with courses that cover Canadian civics, society, politics, institutions, public administration, public and defence policy, the Canadian judicial system, Indigenous studies, political theory, and Canadian geography.
- 🏛️ On North America, with courses that cover American and comparative foreign, defence and security policy, politics, institutions, and borders.
- 🏛️ On the World, with courses that cover international relations and organizations; elections, political parties and public opinion; international conflict and conflict analysis; contemporary strategic studies and analysis; foresight; terrorism and political violence; nationalism; secessionism, nuclear weapons; cyber; political ideologies; civil-military relations; law of armed conflict; international law of the sea; space law; political geography, and geopolitics.

Building on a foundation in macro- and microeconomics and economic ideas the department's courses in economics educate students in statistics; modelling; money, financial institutions and markets; economic analysis; econometrics; public finance; cost-benefit analysis; environmental economics; defence and security economics; public economics; procurement and industrial

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economic benefits.

More specifically, the Department of Political Science and Economics offers the following programs:

- Bachelor of Arts degree in Political Science, offering a Major (16 credits), Honours specialization (20 credits) or a Minor (8 credits);
- Bachelor of Bachelor of Arts degree in Economics, offering a Major (16 credits), Honours specialization (20 credits) or a Minor (8 credits);
- Bachelor of Arts Degree in Economics and Business Administration (20 credits);
- The option of completing a Bachelor in Political Science entire through Distance Learning (DL) courses offered through the Division of Continuing Studies (DCS);
- Four courses in the Military and Strategic Studies (MSS) program;
- The Master's of Public Administration, offered entirely online, with three specialized streams: (1) Defence and Security, (2) Well-Being and Veteran's Health, and (3) Emerging Technologies.

In addition, the Department of Political Science and Economics support the delivery of the following courses and programs:

- Three courses in the College core curriculum that all students in the Regular Officer Training Plan (ROTP) must complete: International Relations (POE/F116), Introduction to Macroeconomics (ECE/F104) and Canadian Civics and Society (POE/F205)
- Distance Learning (DL) courses offered through the Division of Continuing Studies (DCS).
- Courses in the Bachelor of Military Arts and Sciences (BMASc) offered through DCS.
- The War Studies program including Masters and PhD courses and fields and degrees in defence studies, international relations as well as comparative politics.
- The Master's in Defence Studies program at the Canadian Forces Staff College (CFC) whose students can extend their studies to the RMC MPA through additional credits and coursework.
- The Defence Studies program at the Canadian Forces Staff College (CFC) in Toronto through onsite lectures.
- Continuing Education Officer Training Plan (CEOTP) – Pilot program providing a BMASc with a focus on Air Power.
- Professional Development for the Canadian Armed Forces, the Department of National Defence, and the Government of Canada.

The Political Science and Economics Department has a robust track record in aligning its courses and programs with Canada's defence policy to ensure they are impeccably prepared in content and skillsets as current and future junior and senior officers. The Department's faculty members are heavily invested in experiential learning, including an annual team entry to a model NATO competition in the United States where the RMC entry routinely wins the most coveted prizes and an annual trip to Parliament Hill. The Department is also the main organizer of an annual Defence and Security Economics Workshop that encourages frontline research in Defence Policy and economic analysis of conflict and security. The Department also hosts the Center for

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Security, Armed Forces, and Society (CSAFS), a research center who attracts yearly about half a million dollars in research grant since 2014. CSAFS, which developed a solid partnership with DRDC, regularly run international symposiums and publishes research reports on relevant topics for DND and the CAF, mainly on strategic communications by states and non-state actors.

Program Evolution

The recent recoupling of Political Science and Economics within the same department provides a structure that is unique among Canadian universities, and allows both students and faculty to explore the interconnections between these two disciplines. One of the opportunities for future work is the development of a Master's in Public Administration Program. Overall the Department is healthy and experiencing high enrollment in both its undergraduate and graduate programs, which is evidence of its relevance and appeal to Canadian Forces members.

The Political Science and Economics Department will also continue to enhance the quality of educational experiences for students by continuing to engage in a broad range of leading edge research, including projects on cyber security; border security; strategic communications; digital subversion and democratic integrity; Special and Joint Forces Operations; bilingualism; Canadian foreign and defence policy; transatlantic relations; peacekeeping; Canada's stabilization mission in Mali; Canada's contribution to NATO's enhanced Forward Presence in the Baltic states; transnational terrorist financing and global money laundering; recruitment, retention, attrition, diversity and inclusion; intelligence and security review, oversight and accountability.

The Department has played an important role in the RMC's Distance Learning (DL) program. The success of our DL courses among undergraduate and graduate students speaks to its reputation for excellence and the relevance of these components, their delivery, the skillsets acquired, and the expertise of the professors. The Department is committed to further supporting the DL program by developing more online courses and updating and improving the existing ones, at both undergraduate and graduate levels, to meet the needs of a more diverse CAF.

The Department has a distinguished track-record in research, teaching, and service to the Faculty, RMC, and community. In order to maintain this record, the Department should be able to attract and retain professors with strong publication records, and distinguished teaching and service portfolios. The quality of our faculty is key to producing officers who meet the needs of the CAF in an ever-changing globalized world.

RMC Academic Departments
The Faculty of Science
The Department of Chemistry and Chemical Engineering

Degree Programs

The department of Chemistry and Chemical Engineering (CCE) at RMC is committed to the education of Officer Cadets in the stimulating and broad fundamental and applied areas of CCE applied to their mission as future officers in the (CAF. The program emphasizes Chemical, Biological, Radiological and Nuclear (CBRN), Life Science and Environment in the Chemistry Program and Materials, Nuclear and Ammunition Engineering in the Chemical Engineering Program. Through strong links with different DND stakeholders, the CCE department has developed different programs, certificates and courses to disseminate knowledge to military members addressing a very broad range of CAF needs. The vision of the Department is in line with Canada's Defence Policy, *Strong, Secure, Engaged (SSE)* in terms of education, innovation and cutting edge research & development as well as equity, as highlighted in the sections below.

Bachelor degrees:

Chemical Engineering: the strength of the accredited¹ chemical engineering programme defined by an applied understanding of materials, transport and transformation of matter, transfer of energy, design of products and processes (e.g. for fuels, explosives) is also highlighted in the special emphasis to fields of interest to the CAF through senior level courses in:

-  Nuclear engineering (with a SLOWPOKE-2 Nuclear Reactor on-site)
-  Environmental engineering
-  Ammunition engineering
-  CBRN defense systems

Chemistry: the strength of the chemistry program, with its focus on precise understanding of reactivity, molecular interactions, material as well as biological systems and their environmental impact is particularly relevant for the CAF in the following areas:

-  Environmental protection and remediation (Minor in the program)
-  Necessary background needed for medical related schools (Minor in Life Science)
-  Chemical, Biological, Radiological and Nuclear expertise (Minor in CBRN)
-  Expertise in the development of detection systems for chemical/biological threats

The collaborative efforts of the members of the CCE department enable rigorous academic programs to be offered to the ROTP/RETP students allowing them to be exposed early to technical skills, critical thinking and problem solving that will be key to their success in the CAF. The technical knowledge acquired is in line with critical needs of the CAF in the area of ammunition (collaboration with DAEME & Strat J4 and JCET), fuel and energy (in line with

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SSE alternative energy vision), detection and protection related to CBRN-E incidents (collaboration with CJIRU and DJCBRND), environmental protection (in line with SSE “greening defence”), medical field (in line with SSE priority for “critical occupations facing shortages”: medical officers, dentists, pharmacists).

The department has shown its commitment to gender equality and equal opportunity, a priority of the CAF as detailed in SSE “leveraging Canada’s diversity”. Indeed, over the past five years, 27% of the graduates from the bachelor’s programs in CCE were female (the overall goal for the CAF is to achieve 25% representation of women by 2026). This commitment of the department is reflected with 35% representation of women among indeterminate positions (Professor, Technical Staff and Administrative staff).

Graduate Studies: (MSc, MAsC, MEng and PhD):

Graduate students in CCE are registered in PhD, MAsC, MSc or MEng in three different fields: Nuclear, Environmental, Chemical and Materials (total of 58 graduate students). These degrees contribute directly to the Post Grad Military specialty qualifications of CAF Officers which are required to serve in key positions across DND (AEPB: Chemical Engineering, ADUM: Environmental Engineering, AEOX: Nuclear Engineering, AENF: Non-Destructive testing, AEXO: Advanced Ammunition Engineering).

Certificates and other programs:

The department offers and plans to offer different certificates and series of courses to fulfill CAF needs for both on-site and off-site education. An excellent example is the Certificate in Ammunition Technology which in addition to a practical phase in Borden, leads to the military specialty qualification: AEXN: Ammunition Technical Officer. The department has shown its adaptability with the development of a weeklong intensive course designed for CANSOFCOM on explosives. The department is also fully committed to the Aboriginal Leadership Opportunity Year (ALOY) program providing teaching and tutorials for the students and delivers courses to AMS programs on Weapon Systems, CBRN and general chemistry.

Research:

The high level education received by the Officer Cadets is reflected in the internal and external cyclical reviews of the programs and in the internationally recognized research performed by the faculty members in CCE which ensure a direct knowledge transfer of highly relevant material for a world class education of future officers. Peer review of publications, of funding support and of graduate programs at the international and national levels continues to be a reference by which quality control is maintained. The relevance of the departmental research to the CAF/DND and to the government agencies is reflected in the research funding obtained with a distribution of: 46% from DND, 44% from other government departments and 10% from federal and provincial granting agencies including NSERC in 2017-2018 and a total funding of \$30.8M over 5 years.

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The research and innovation performed in the department aligns with the SSE Innovation for Defence Excellence and Security (IDEaS) program: ranging from environmental impact/remediation, to energy sources (fossil, nuclear, alternative and renewable), synthesis of fuels from waste and carbon dioxide, energy storage and carbon sequestration, to explosives and ammunition. In addition, the expertise of the professors and researchers in CCE is often linked to logistical and operational needs within DND (e.g. CBRN protection).

Impact and Connection to the Profession of Arms

This vision for the department and its relevance for the CAF will also have an impact in its role for society and in the government. Indeed, our environmental sciences group (ESG) continues to support DND with environmental baseline and closeout studies for all deployed operations, and the federal government with the management of contaminated sites (100+ sites over the last 30 years). In addition, several outreach initiatives have been implemented within the community, such as visits of the department, of the SLOWPOKE nuclear reactor, participation in *science fair*, *science rendez-vous*, encouraging girls in engineering. These efforts will be reinforced. Another mission of an academic federal institution is to facilitate communication between science and the government and to share technical knowledge. To this end, the department is developing an internship with the Privy Council for students in the BSc and BEng degrees to spend between 4 and 8 months using their technical knowledge while learning about the complex political, social, and global environment. The department was also the lead in initiating a new program, *Science meets Parliament*, bridging the gap between science and Parliament. This initiative was a partnership between the Canadian Science Policy Center and the Office of the Chief Science Advisor.

Program Evolution

The mission of the department of CCE is to provide a recognized high level education in the fields of chemistry and chemical engineering to future officers of the CAF. The stimulating education, relevant to their career goals, will promote their problem-solving skills, inspire independent thinking and develop leadership potential. This mission is intimately linked to the research expertise of the different faculty members incorporating their original research findings into the classroom. The broad range of research performed in CCE creates a conducive environment from fundamental research to development of products and fast solutions for operational needs. This inspiring environment provides a strong base for a world class education at the undergraduate and at the graduate level. The department is also responsive to the academic needs of the CAF providing and developing certificates to fulfill the academic requirements needed for specific certifications (e.g. Ammunition (past 7 years), CBRN in development).

Implementing the vision:

This vision, in line with the mission of CCE, will ensure the quality of the education in our different programs as well as maintaining and expanding our relevance to the CAF.

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Continual Improvement:

- 👤 The department will engage the stakeholders, the military faculties, the students and graduates to participate in yearly meetings ensuring a program that is relevant for the CAF with increased military content, while maintaining rigorous academic program that satisfy the IQAP and accreditation process.
- 👤 Stakeholders and students engage in a conversation with the faculty members and chairs of program. Small changes will be implemented the following year, larger changes will require Syllabus/Faculty Board/ Faculty Council approval.

Optimizing course offerings:

- 👤 Joint delivery of some upper year undergraduate courses with relevant graduate courses including Ammunition and CBRN.
- 👤 Generalizing the offering of alternate French/English courses every other year to core courses for 2nd, 3rd, and 4th year students in the Chemistry programme.
- 👤 Joint delivery for relevant upper year courses for students in Chemistry and in Chemical Engineering.
- 👤 Joint delivery of on-site and Distance Learning courses for selected courses improving interactions and furthering the professional development of off-site students.
- 👤 Joint delivery of upper year and graduate courses with different learning objectives for each level to further independent learning and initiatives for ROTP/RETP students.

Offering certificates of relevance to CAF:

- 👤 Finalizing the CBRN certificate as the academic units towards a CBRN Technician certification in partnership with CJIRU
- 👤 Developing a certificate in environmental protection for a distance education delivery to fulfill the increasing need of the CAF for environmental impact assessment

RMC Academic Departments

The Faculty of Science

The Department of Math and Computer Science

Degree Programs

The Department of Mathematics and Computer Science (M&CS) delivers undergraduate and graduate degrees in Science with programs in mathematics and computer science. Faculty members in the Department teach both mathematics and computer science courses with many teaching in both fields. Since every student at RMC in the Regular Officer Training Plan (ROTP) is required to take mathematics and computer science, a significant number of the course credits taught by M&CS are taught as service courses to students in programs other than mathematics and computer science.

Impact and the connection to the Profession of Arms

Similar to universities across Canada, the weakness of math preparation skills in current Officer and Naval Cadets is a significant obstacle to their success in all RMC academic programs. Accordingly, RMC implemented a “math assist” program, which has become part of the College Success Centre, to help students overcome this obstacle and the qualified mathematicians in M&CS are indispensable to providing effective help to our students. To further address the math skill deficiencies identified with students, M&CS has adjusted the delivery of certain courses and the cadre of professional mathematicians with current expertise was vital to our ability to respond quickly and effectively to these changes.

With an ever-increasing need within the CF for the use of technology as a force multiplier, the officer corps as a whole must be confident in their knowledge of information technology and the influence that it can have on our ability to successfully complete missions. A portion of the officers must not only be fluent in the current capabilities offered with current technologies but due to an increasing rate of advancement, they must have an indepth understanding of these future capabilities and the potential effects on both the CF and our allies as well as our adversaries.

Instilling an ethos of critical thinking and problem solving is at the core of mathematics and computer science. Students are challenged to undertake collaborative projects in order to foster positive group dynamics, a skill that young officers will need throughout their careers.

An investment in faculty and staff is an investment in students and therefore the university. Professional development and research opportunities will attract the best and will enable people to be on top on their game and to be excited about what they are doing. They will bring that passion and enthusiasm into the institution and classroom for the benefit of the students and the institution itself. For M&CS, the core of full time regular mathematics faculty also contributes to RMC’s engineering accreditation with the Canadian Engineering Accreditation Board (CEAB).

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The M&CS faculty members are actively engaged in research and this not only enhances the quality of teaching in the classroom, but it also provides the Department of National Defence (DND) with an invaluable source of expertise in a number of areas. As articulated in the Defence Policy, *Strong, Secure, Engaged (SSE)*,

The information revolution is one of the key drivers of many of the most exciting opportunities in the world. Modern militaries rely on networks and data to plan and carry out missions. Much of what gives Western forces their technological and tactical advantage stems from space-enabled systems, and agile information management and technology tools to aggregate and manipulate large quantities of data.¹⁰⁴

Program Evolution

The Defence Policy: SSE indicates that “[t]echnological developments point to a future of defence that is expected to be vastly different than today, with a greater emphasis on information technologies, data analytics, deep learning, autonomous systems...”¹⁰⁵ The evolution planned for the M&CS Department is in keeping with the growing demand for people with expertise in data analytics as well as cryptography (SSE 46) and artificial intelligence predicted for the rapid evolution of technology. The M&CS Department has the following priorities:

- 📌 Working with the Assistant Deputy Minister (Data, innovation and Analytics) to develop a program or a concentration in data analytics
- 📌 Examining timetabling options that would allow more students in other programs to take some of the specialized mathematics courses.
- 📌 Becoming of a centre of excellence in the area of artificial intelligence, and more specifically the field of machine learning. Expand our relationship with DRDC and foster new partnerships with the environmental and other commands where the use of artificial intelligence is becoming a necessity.

¹⁰⁴ *Strong, Secure, Engaged*, 55, online at <http://dgpaapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf>.

¹⁰⁵ *Strong, Secure, Engaged*, 55.

RMC Academic Departments
The Faculty of Science
The Department of Physics and Space Science

Degree Programs

The mission of the Department of Physics and Space Science is to foster intellectual development and creativity in officers and members of the Canadian Armed Forces (CAF). The Department teaches the fundamental concepts of the physical universe and the scientific method of problem solving and symbolic analysis at both the undergraduate and graduate levels, while also providing a spectrum of activities in the discipline. Department faculty members carry out active research in three fields of faculty expertise – Space Science, Materials Science, and Acoustics and Oceanography. This research supports the undergraduate and post-graduate programs, the objectives of the CAF, and the betterment of Canadian society.

The Department of Physics and Space Science delivers bilingual undergraduate (UG) Honours and Major programs in Physics and in Space Science. Each year, these programs graduate a group of officers with advanced analytical skills, strong physical situational awareness, a firm grasp of fundamental physical principles, and the confidence to apply abstract concepts to solving concrete problems.

The Department also delivers Post-Graduate (PG) programs, at both the Master's and PhD level. PG education allows officers in the CAF to devote time to in-depth study particular aspects of CAF-relevant problems at the same time as they focus on furthering their understanding of the fundamental physical principles and issues associated with many technical requirements and applications within the CAF. PG education allows the officers to develop a deeper appreciation of the concepts of research and development and the professional and scientific relationships necessary to bring successful research to fruition.

The Department also supports programs in the Faculties of Engineering, Humanities and Social Sciences, and Continuing Studies by offering courses presenting basic and intermediate Physics concepts (the Science Core), modern philosophical concepts in physics, and the scientific methodology (observation, modelling, experimentation and symbolic analysis, combined with skepticism and self-reflection) to Officer Cadets in those Faculties. This provides them a framework within which to develop abstract problem-solving skills, and an appreciation for the scientific concepts inherent in a rapidly changing technological environment.

Impact and the connection to the Profession of Arms

UG programs in Physics and Space Science directly serve a population of 40-50 Major and Honours Officer Cadets at any time, with typically 15 students graduating each year. Students graduating from both programs benefit from a strong mathematical and practical problem-solving curriculum, and a foundation of introductory and intermediate courses in classical mechanics, electromagnetism, modern physics, statistical physics and thermodynamics, instrumentation, modern optics, and computational methods. All courses expose students to both theory and applications, and many courses include a hands-on, laboratory component.

Senior UG courses offered in the Physics program allow Officer Cadets to explore modern physical theories and approaches in more depth and with greater sophistication, including quantum mechanics, solid-state physics, nuclear physics, electromagnetic theory, and astrophysics. These advanced courses provide the necessary tools to understand technological advancements in a quickly evolving world. Honours Physics students complete a full-year research project under the mentorship of a faculty member, providing a first exposure to the principles and challenges of real-world scientific research and development.

Senior students in the Space Science program study orbital mechanics, space systems design, satellite communication and navigation, remote sensing of the Earth and Space, and the physics of the near-earth space environment. These courses provide a strong foundation for space situational awareness. Honours Space Science students complete a full-year team project in space mission analysis and design; in recent years, these projects have culminated in the launch of high-altitude balloon payloads designed to validate methodologies and instrumentation designed by the students.

The Introductory Physics course (a Science Core requirement for all Science and Engineering students) delivered by the Department serves approximately 140 first-year students annually, while the intermediate Classical Mechanics course (offered to Physics, Space Science, and Civil/Mechanical/Aeronautical Engineering students) serves an additional 100 second-year students each year. These courses provide the foundations of Statics, Mechanics, Optics, Electrostatics, and Fluid Dynamics that are required for more advanced study of these subjects in the Science and Engineering programs.

Courses delivered by the Department to students in the Faculty of Humanities and Social Science – on-site and via the Division of Continuing Studies – satisfy the requirements of the RMC Common Core, and typically serve an additional 120 students per year.

At the PG level, the Department of Physics and Space Science delivers education at the MSc and PhD levels to CAF officers, officers of allied forces, and civilians. Many PG candidates are sponsored to obtain advanced education in specific domains by DND and international agencies and directorates. The Department is responsible for training military officers in the following specific areas of military specialization: Electro-optics Engineering and Maintenance (AEPD), Physics (AFAK and AIIH), Ocean Acoustics (AIEI), Underwater Acoustics (AEOR) and Non-destructive Testing (AENF). Typical enrollment at any time is approximately 15 PG students,

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with typically 2 or 3 students graduating annually.

Physics is the most fundamental of the sciences, and therefore underpins all of the Scientific and Engineering disciplines. It furthermore exemplifies the key principles of a scientific approach to understanding the physical world. As a consequence, officers educated in the Physics and Space Science programs will acquire the necessary technological knowledge and critical thinking skills that enable them to be efficient, thoughtful, and effective in their military occupations, whether they are employed in the Army, Navy or Air Force equipment maintenance and engineering, acquisition, or life cycle management. UG and PG programs in the Department of Physics and Space Science contribute directly to expertise in the fields of electro-optical systems for aircraft, image analysis, ocean currents and conditions, biological threat assessment, laser weapons, non-destructive testing of tanks, submarines and aircraft, optical devices and communications, and solar energy sources. The Space Science programs specifically train future officers in remote sensing, surveillance of and from Space, Space debris tracking, Space situational awareness, Space mission design, launch and, operations, GPS and communications via satellites, rocket tracking, and Space environment effect on satellites and humans.

The Defence Policy SSE¹⁰⁶ identifies the Space Domain and Space capabilities as key priorities. The Department reflects these interests by conducting cutting-edge research and development on new Space technologies in close collaboration with allies, industry and academia to enhance the resilience of Space capabilities and support the CAF's Space capability requirements and missions (Initiative 86). The Department also contributes to the defence and protection of military Space capabilities through the development of satellite propulsion technologies that enable larger and more frequent avoidance maneuvers and allow longer mission lifetimes with greater capacity for orbit station-keeping (Initiative 83). We also aid in the acquisition of Space capabilities meant to improve situational awareness and targeting, including: replacement of the current RADARSAT system to improve the identification and tracking of threats and improve situational awareness of routine traffic in and through Canadian territory; sensors capable of identifying and tracking debris in Space that threatens Canadian and allied Space-based systems (surveillance of Space); and, Space-based systems that will enhance and improve tactical narrow- and wide-band communications globally, including throughout Canada's Arctic region (Initiative 45).

Space Science program graduates receive automatic credit for the Basic Space Operations Course (BSOC)¹⁰⁷, which is intended to provide an introductory basis of Space history, concepts and terminology associated with a wide variety of Space systems to CAF officers.

UG programs in Physics and Space Science satisfy educational requirements for most military occupations. In the current published matrix, the Physics or Space Science UG degrees are compatible with all RMC-relevant military trades except 3 (Intelligence, Personnel Selection, and

106 <http://dgpaapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf>

107 <http://www.forces.gc.ca/en/training-establishments/international-training-programs-courses/space-applications-course.page>

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Construction Engineering). Officer Cadets registered in our Department's programs have military trades such as Mechanical Engineering, Electrical Engineering, Communications and Electronics Engineering, Aerospace Engineering, Marine Systems Engineering, Pilots, Air Combat Systems, Aerospace Control, Signals, Armour, Artillery, Naval Warfare and Infantry.

Program Evolution

The Department's capabilities, plans, and objectives appear to be well-aligned with the SSE Defence Policy. However, technology is evolving rapidly. Novel technological advancements are often of immediate use to DND, as they provide military personnel an advantage in operations around the world. Whether it is solar energy harvesting during a remote deployment or robust communication with Space assets, the Physics and Space Science Department will continue to evolve in future years since its composition, teaching, and research objectives are continuously adapting to the state of current technological knowledge in the various Engineering and Science disciplines.

The Department of Physics and Space Science maintains energetic collaborations with DG Space and DRDC Ottawa/Valcartier to ensure the value of RMC UG and PG education, and research programs, to the CAF. The Department also maintains frequent communication with the various Military Occupation Specialty champions of PG officers being trained in our department. These champions provide direct input on the type and military relevance of the research projects that are undertaken during the course of the sponsored officers' PG studies.

The Department is currently adapting the Space Science UG program to satisfy the requirements of the Space Operations Course (SOC)¹⁰⁸, designed as follow-on to the BSOC to prepare personnel for employment in Space-related positions at home and abroad. A Space Operations certificate, capable of being completed complete on-line by NCMs, is also being considered, as are re-developing our offerings of non-specialist courses for Arts students. The Department currently supports a limited number of exchange programs with other militaries (notably with the USAFA and the RAAF, and are discussing expanding these programs.

More generally, the Department is in consultation with DG Space to better connect the UG and PG programs to space occupations in the CAF. As an example, our UG programme is currently evolving to include Space law and Space operations (aided by our S-Band capability). Acoustics and Oceanography faculty in the Department are reviewing the Oceanography programme for UGs, possibly with the aim to develop a combination Physics-Oceanography specialization or a minor in Oceanography. A key element of this program would be a new oceanographic sampling course offered during the fall term, with extensive field work taking place on Lake Ontario using the Cordite tug boat. Our objective is to include operationally relevant material that will benefit Maritime Surface and Sub-Surface Naval Cadets of which there are generally 60 to 70 at RMC.

108 <http://www.forces.gc.ca/en/training-establishments/international-training-programs-courses/space-operations-course.page>

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RMC Academic Departments

The Faculty of Engineering The Department of Applied Military Science

Degree Programs

The Department of Applied Military Science delivers two programs simultaneously: the Army Technical Staff Officer (ATSO) Program and the Army Technical Warrant Officer (ATWO) Program. The aim of both programs is to prepare Officers from the rank of Captain to Major and Non-Commissioned members from the rank of Warrant Officer to Master Warrant Officer to work in a variety of post-program assignments that support the development of new capability for the Canadian Army. Program graduates work as project directors for new equipment acquisition projects, trial and evaluation specialists in CAF trial, evaluation, or testing centres or technical advisors in Canadian Army Centers of Excellence where new capabilities are further developed and brought into service with the Canadian Army.

The 11-month program starts by providing candidates with a fundamental grounding in mathematics, statistics, chemistry and physics at the college/undergraduate level. This knowledge applies across the spectrum of technologies that are integral to the development of new capabilities for the Canadian Army, including Vehicle Systems Engineering, Military Communications Systems, Battlefield Surveillance and Target Acquisition Systems, Chemical Biological Radiological and Nuclear Defence Systems, Weapons Systems, Human Factors Engineering, Logistics Engineering, Decision Analysis Techniques and Trials and Evaluation Methodology. The program culminates with education and training in Systems Engineering Principles as well as education on the fundamentals of the systems and processes used for Defence Management and Procurement in Canada, including the fundamentals of Project Management.

Successful program graduates leave with the qualification of ATSO or ATWO as well as with the qualification required to lead formal trials and evaluations for the Canadian Army. The program graduate is prepared to be a leader in the field of Canadian Army capability development with the technical grounding in science and technology to make them a capable advisor to senior departmental leaders. The graduate is also knowledgeable enough in the field of program and project management within DND to efficiently and effectively shepherd new capabilities into service with the Canadian Army. Candidates who apply to and are accepted for admission into the Faculty of Management can achieve advanced standing in the MBA program with minor additional work upon completion of the program.

Impact and Connection to the Profession of Arms

The programs delivered by the Department of Applied Military Science are in direct support of the number two priority, *Long Term Investments to Enhance the Canadian Armed Forces Capabilities and Capacity to Support Peace and Security* as articulated in Strong Secure

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Engaged (SSE) – Canada’s Defence Policy. Program graduates play a fundamental role in the process, providing the expertise and advice necessary for the Canadian Army to facilitate the recapitalization of the aging vehicle fleets and modernization of command and control systems identified as priorities in SSE.

Program Evolution

The program continues to evolve on an annual basis in order to keep pace with the rapid changes in technology that characterize the defence industry. An annual program evaluation in April/May of each year prepares the way for changes to be introduced to the program to keep the material as relevant as possible. Recent changes include a greater emphasis on aspects of cyber technology and cyber defence as a component of every new capability being developed. This evolution also benefits greatly from RMC’s position as a cyber centre of excellence for the CAF and DND.

The program’s emphasis on maintaining close ties with the Canadian Armed Forces user community, other government stakeholders and with industry forces a constant evolution of material and focus. Annually, students choose term projects from among dozens of project proposals put forward by stakeholders, including the Canadian Army, CANSOFCOM, Defence Research Establishments and industry partners. These project proposals represent current issues that stakeholders are dealing with that are technical or programmatic in nature and that would benefit from student research and analysis. Students present their research findings to senior leadership as well as to the stakeholder and it is this mechanism that helps ensure the program benefits from consistent annual input and feedback into the problems being faced within the defence community as a whole and the material and the problems that the program deals with.

RMC Academic Departments
The Faculty of Engineering
The Department of Civil Engineering

Degree Programs

Well-trained and experienced civil engineers are an essential component of any successful military organization and the Canadian Armed Forces is no exception. From overseas deployments to domestic emergency response, civil engineering support is a critical DND requirement. Graduates of RMC's civil engineering program (CE) are well qualified to meet the wide-ranging needs of the Canadian Armed Forces (CAF). The civil engineering program offers an accredited undergraduate degree in civil engineering, a Masters of Applied Science (M.A.Sc.) degree with a specialization in structural engineering, geotechnical engineering or civil engineering, as well as a Masters of Engineering (M.Eng.) and Doctorate of Philosophy in civil engineering.

Impact and Connection to the Profession of Arms

Courses delivered by CE align with the Canadian Engineering Accreditation Board Requirements, with a unique focus on the needs of the CAF. Unlike most other CE programs across Canada, CE undergraduate training at RMC includes courses in geomatics, military engineering, and site specific field investigations. Undergraduates receive an accredited engineering degree as well as a solid introduction to the role of military civil engineers in the CAF. Furthermore, the CE graduate program provides essential specialized training to military engineers in the fields of structural engineering, geotechnical engineering and environmental engineering, all with a strong emphasis on real military applications in the CAF. The majority of students enrolled in the program are from the Engineer and Construction Engineering occupations and the technical challenges that they will face in their careers as officers are specifically addressed in the program. The breadth and depth of the Civil Engineering undergraduate program, significantly compliments the skills and knowledge required of Military Engineering Officers within the CAF.

Civil engineering is a critical requirement of every overseas or domestic CAF deployment, emergency response, and/or disaster relief operation. Everything ranging from providing safe potable water supplies in remote areas, to ensuring mobility of our military forces to blast protection for critical infrastructure in conflict zones requires qualified civil engineers and the RMC CE program fills that requirement. In every respect, the CE program is designed to meet the needs of the CAF and satisfy the Canadian Defence Policy: *Strong, Secure, Engaged*. Our graduates are well prepared to lead and provide expert advice in all aspects of military engineering.

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Program Evolution

The CE department continues to evolve its program to meet the needs of the CAF. In addition to the essential engineering requirements of the CAF, future program emphasis will focus on blast protection, Arctic infrastructure, environmental assessment and remediation, climate change, ground support and the sustainability of current CAF infrastructure assets. The CE program has adapted and evolved by engaging new faculty with compatible expertise and experience, as well as by promoting new areas of research. More specifically:

- ✿ The two most recent faculty hires (2016) have provided the CE department with enthusiastic professional engineers with active research programs addressing geotechnical engineering challenges in the Arctic, and assessment of aging infrastructure including bridges and hanger facilities.
- ✿ Three planned faculty hires are scheduled for 2019, one of which will be tasked with developing and promoting a protective-engineering program in the CE department. Over the past several years, existing faculty have developed strong connections to existing international blast experts and the CE department is now well positioned to continue to build in-house expertise and develop research programs designed to meet current and future needs of the CAF.
- ✿ The RMC Green Team is a research organization within CE focused on infrastructure and environmental issues facing DND and the CAF. This group conducts Nation-Wide projects in support of the Assistant Deputy Minister (Infrastructure and Environment), Directorate of Architecture and Engineering Services, Urban Planning Division, Real Property Operations Group, Director Land Environment, Director Land Requirements, Canadian Joint Operations Command and 1 Canadian Air Division. The Green Team supports graduate research programs that enhance and enrich our undergraduate program.
- ✿ The Military Engineering Research Group (MERG) actively supports graduate research in support of DND needs, as well as providing valuable project and learning opportunities for our undergraduates, ultimately helping to train military engineers with a more complete appreciation of the CAF engineering demands.
- ✿ The department continues to develop synergies with 1 Engineering Support Unit (1ESU). This unit provides critical military and civil engineering support for CF operations overseas. The recent re-location of 1ESU to Kingston has further cemented and expanded this long-term relationship. 1 ESU sponsors many of our PG students, most of whom are graduates of our undergraduate program. 1 ESU has access to the Department's advanced testing capabilities, educational opportunities, and expert technical advice. With the co-location of the two units, this relationship and the associated benefits will continue to grow.
- ✿ In addition to providing advice related to all aspects of military bridging for the CF and DND, the department is responsible for the development of doctrine and software related to the assessment of bridges, known as the Military Load Classification (MLC) System. The

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department is responsible for the development of a suite of MLC software not only for the CF but also for NATO. This material is an integral component of undergraduate instruction in structural engineering.

In addition to evolution of faculty expertise and research direction, the CE department is continually evaluating the undergraduate program to ensure that our CE graduates are well qualified and well suited for a career in the CAF. Specific improvements include:

- The CE department completes a regular evaluation of our undergraduate curriculum to ensure that the undergraduate training is current, meets the existing and future requirements of the CAF, is consistent with Canadian Engineering Accreditation Board requirements, and, most importantly, provides our students with a rewarding and challenging experience. The CE department's next full curriculum review is scheduled for early summer of 2019.
- The CE department is constantly networking with the CAF and other governmental agencies to develop CAF relevant engineering projects for our 3rd year field school. This is an important component of our program and sets us apart from other universities in Canada. This field school is a core course for our students and provides a unique opportunity to investigate real engineering problems, typically with an experienced CAF client. The students gain both practical engineering experience, as well as an appreciation for CAF engineering needs.

RMC Academic Departments
The Faculty of Engineering
The Department of Electrical and Computer Engineering

Degree Programs

The Electrical and Computer Engineering (ECE) Department offers Bachelor of Engineering degrees in Electrical Engineering and Computer Engineering, and Masters and Doctoral degrees in Electrical and Computer Engineering with specialization in several fields including cyber security. These degree programs respond directly to the CAF need to attract and educate “Canadians with the aptitudes and skill-sets required to succeed in highly technical domains such as space and cyberspace and to operate and maintain increasingly sophisticated equipment, including remotely piloted systems.”¹⁰⁹

In addition, the ECE Department offers several short courses in Cyber Security and in Electronic Warfare each year to Officers and Non-Commissioned Members of the Canadian Armed Forces, to DND civilians, and to members of other Government departments including the Communications Security Establishment (CSE) and the Royal Canadian Mounted Police. The Department teaches courses on information systems, communication systems, and battlefield sensors and target acquisition in the Army Technical Staff Officer and Army Technical Warrant Officer programs. Finally, ECE’s Cyber group co-teaches a course in Cyber Policy as part of RMC’s Master of Business Administration program.

Impact and the connection to the Profession of Arms

The Defence Policy: *Strong, Secure, Engaged* notes that “Three categories of capabilities have become particularly critical to modern military operations – space, cyber and remotely piloted systems.”¹¹⁰ These areas are characterized by a heavy reliance on computer hardware and software, electromagnetic communications and sensor systems, electrical power, control systems, and machine intelligence, which represent the core competencies instilled by programs in the Department of Electrical and Computer Engineering.

At the undergraduate level, ECE programs begin by providing a foundational understanding of the electrical and computing technologies that underlie modern military systems. These are followed by specialized courses in software development, cyber security, digital electronics, electrical power systems, control systems and robotics, and radar and electromagnetism. Both undergraduate programs end with a capstone system design course. Taken as a whole, these programs prepare ECE graduates to lead in the operation and maintenance of modern military equipment and systems of all types.

At the graduate level, ECE programs provide specialized education in Electrical and Computer

¹⁰⁹ *Strong, Secure, Engaged*, 20, online at <http://dgpaaapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf>.

¹¹⁰ *Strong, Secure, Engaged*, 70.

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Engineering supporting eighteen designated Officer Specialty Specifications (OSS). RMC is currently the only university accepted by the Canadian Armed Forces to offer the OSS AKQX (Computer Network Security) in support of the *Strong, Secure, Engaged* focus on Cyber warfare.

For many years, ECE graduate and undergraduate students participated in the annual Cyber Defence Exercise (CDX) sponsored and directed by the US National Security Agency (NSA). When the NSA discontinued CDX after 2017, RMC ECE generated its own version, CyberX. This exercise involves and trains not only our own faculty and students, but also personnel from Director Technical Airworthiness and Engineering Support, Director General Cyber Operations, CSE, the NSA, and the US Air Force's Rome Labs. The exercise provides an educational and training experience of direct relevance to future Cyber operations and could not be held at any other Canadian university. Officer occupations that particularly benefit from graduates of ECE programs include Naval Combat Systems Engineering, Aerospace Engineering, Signals, Communications and Electronics Engineering, and Electrical and Mechanical Engineering. In addition, the Intelligence occupation is increasingly seeking officers with backgrounds in Cyber Security.

Program Evolution

As indicated above, ECE programs and courses are already well-aligned to the objectives of *Strong, Secure, Engaged*. However, ECE continuously evolves both programs and courses to meet the changing needs of the Canadian Armed Forces. This evolution is supported by close linkages with other Department of National Defence agencies. ECE professors are deeply involved in Defence research projects in the Air, Land, Sea, Joint, Special Operations, and Cyber domains. These give the department direct insight into the future technology education needs of the CAF and assist it in ongoing program design. In addition, the ECE Department hosts permanent detachments from the Directorate of Cyber Force Development and the Royal Canadian Air Force Air Warfare Centre, which give the department immediate insight into educational support to operations.

The ECE undergraduate programs were comprehensively reviewed and updated in 2012 and again in 2017. In Electrical Engineering, changes included an enhanced series of courses on Radar and Electronic warfare, with both foundational courses and a capstone course in Radar Signal Processing. In Computer Engineering, a program-core course in Cyber Defense was added in 2014, and courses in Cyber Attack Theory and Secure Web Development will be introduced in 2020–2021. All these changes are consistent with *Strong, Secure, Engaged*. A full program review is planned for 2021 to assess the impact of these changes and to further adapt the undergraduate programs as necessary.

At the graduate level, ECE has recently introduced enhanced courses in Radar and Electronic Warfare. The ECE graduate offering in Cyber Security is now the most comprehensive in Canada, with a total of seven general and specialized courses, four of which were introduced in the last two years. With the expected hire of new faculty members in Autonomous Vehicles and Embedded Systems, ECE will further enhance its graduate offerings in concert with the direction of *Strong, Secure, Engaged*.

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RMC Academic Departments

The Faculty of Engineering

The Department of Mechanical and Aeronautical Engineering

Degree Programs

The Department of Mechanical and Aerospace Engineering offers a Bachelor of Engineering degree in Mechanical Engineering, a Bachelor of Engineering degree in Aeronautical Engineering, and Masters and Doctoral degrees in key areas related to Mechanical and Aerospace Engineering.

Mechanical Engineering: Mechanical Engineers are innovators and focus on the analysis, design, manufacturing and maintenance of items of all size, which extend humans physical abilities, from large manufacturing plants to nano-machines. Mechanical Engineers work in a team environment, with solid leadership and communications skills, in all levels of industry, Public Service and Military organizations.

Aerospace Engineering: The basis for Aeronautical/Aerospace Engineers is a strong foundation in Mechanical Engineering. Aeronautical Engineers focus on the design, science and construction of Aircraft, Spacecraft and Airborne Weapons technologies. Aerospace Engineers are educated to work with highly interrelated systems, and must therefore understand all aspects of a complicated project, venturing into state-of-the-art technologies and at the forefront of exploring possibilities to allow faster and farther travels, both in the atmosphere and into space.

Degrees (Undergraduate and Graduate degrees): The key targets of Mechanical and Aerospace Engineering summarized above are integrated within the core education delivered to future DND officers (officer and naval cadets). The department of Mechanical and Aerospace Engineering is popular with RMC students and accounts for more than 15% of the entire Undergraduate population (and about 50% of the Engineering student population). The department of Mechanical and Aerospace Engineering offers several Undergraduate degrees (BEng in Mechanical Engineering and BEng in Aeronautical Engineering) and Postgraduate degrees (MAsc in Mechanical Engineering; MAsc in Aeronautical Engineering; MEng in Mechanical Engineering; MEng in Aeronautical Engineering and a PhD in Mechanical Engineering. It should be highlighted that the department also offers an MEng in Aeronautical Engineering in Aerospace Structures (ADOE Qualification) dedicated to responding to the academic knowledge required for operational needs in DND (namely Director of Technical Airworthiness and Engineering Support). The department has also occasionally granted degrees with the propulsion (ADOF) and the aerodynamics (ADOG) specialties. The programs are all accredited by recognized by Provincial and Federal institutions (such as CEAB and IQAP) attesting to the high value-added quality of education provided to the students and future leaders of the Canadian Forces.

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Impact and the connection to the Profession of Arms

The degrees offered in Mechanical and Aerospace Engineering have been optimized in consultation with education/industry/DND stakeholders and, by design, are directly connected to the Profession of Arms. Programs are relevant to a broad spectrum of officer occupations for Mechanical (M) and Aeronautical (A) Engineering, namely: Armoured Officer (M/A); Artillery (M/A); Infantry (M/A); Combat Engineering (M/A); Electrical and Mechanical Engineering (M/A); Pilot (M/A); Air Combat Systems (M/A); Aerospace Control (M/A); Construction Engineering (M); Communications and Electronics Engineering (M/A); Naval Warfare (M/A); Naval Combat Systems Engineering (M/A); Marine Systems Engineering (M/A); Logistics (M/A); and Aerospace Engineer (M/A).

Mechanical and Aeronautical Engineering students graduating from RMC are also uniquely positioned within the Profession of Arms to communicate technical information to those in positions of authority for technical equipment and procurement. Members of the Military Faculty serving within the Department of Mechanical and Aerospace Engineering participate in maintaining a privileged communication channel with DND stakeholders. The high-quality educational curriculum designed for the Undergraduate students is also disseminated to stakeholders. For example, each year, the 4th Year Aeronautical Engineering Capstone final presentation is well attended by people from government, the RCAF, and industry.

Excellence and Continued Relevance: The department embraces the “RMC Strategic Plan 2023” by conducting world-class research and members continue to act as experts in specialized fields and defence related topics. For instance, the Department of Mechanical and Aerospace Engineering had a Tier-II Canada Research Chair (2007-2017) and several faculty members serve as leading experts as Journal Associate Editor, Members of AIAA Technical Committees and NATO expert committees. The faculty members have attracted more than \$5.5M in research funding from varied sources both defence related (DTAES, DRDC, DG Space) and competitive prestigious national societies (such as NSERC) over the last 6 years. Faculty members, researchers and post-graduate students have also contributed to over 80 peer-reviewed publications and conferences over the last 6 years.

The Department is active in research themes relevant to the Canadian Forces, providing world-class expertise and advice. The department has also regularly supported the DND short course in Gas Turbine and Structures. Faculty members are also active in professional societies and contribute to national technical agencies and international workgroups (*e.g.*, NATO STO, TTCP) and directly communicate key state-of-the-art knowledge via courses and training to Undergraduate cadets and military post-graduate students registered in the programs.

Mechanical and Aerospace Engineering Alumni: Alumni of Mechanical and Aerospace Engineering have also been prominent in the Public Service and contributed to public outreach in STEM fields, of interest to Canadian society at large. This is perhaps most clearly illustrated by Astronauts Chris Hadfield (RMC Mechanical Engineering 1982) and, more recently, Joshua Kutryk (RMC Mechanical Engineering 2004).

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Program Evolution

The Department of Mechanical and Aerospace Engineering strives to contribute to the targets of the Defence Policy: *Strong, Secure and Engaged* via sub-components of fields highlighted in IDEaS. The department will also evolve to keep pace and assist further with the Defence Policy by providing education and support to future challenges, and to new areas of research. For example, the expertise of the faculty could readily be adapted to support fields of Arctic-related engineering research such as: Autonomous Air vehicles; Air/Sea/Land vehicles and sub-systems; Environmental monitoring and remediation of northern regions; Mobile and fixed robotic systems; Materials and structures designed for harsh conditions; Portable energy sources such as solar/wind technologies for Arctic regions; and Space-related technologies for Northern surveillance, and maintaining Canadian access to space assets.

The academic programs are regularly reviewed to enhance the academic excellence and respond to new challenges in the technological global field. The department will explore the creation of new Undergraduate degree streams of relevance to Canadian Forces as well as specialized courses (*e.g.* Survivability of Engineering systems; and Marine Engineering). The expertise is projected to further grow in topics of relevance to the *Strong Secure Engage* Defence policy with future recruitments in Mechanical and Aerospace Engineering. The intent is to continue attracting and retaining high-quality faculty members and further enhance inclusion, diversity and internationally recognized research and academic excellence within the University on RMC Campus.