

ACADEMIC PROGRAM REVIEW

Summary of Recommendations, Faculty Response and Proposed Actions

Faculty of Engineering and Applied Science Memorial University of Newfoundland

(Approved by Faculty Council, March 30, 2005)

Recommendation 1.1: The current discipline-based structure should be maintained. However, the terms of reference for the Faculty Management Group (FMG) should be amended to make explicit the critical role of the discipline chairs regarding communication between the FMG and their respective disciplines.

Faculty Response

Opinion remains divided on whether the current discipline-based structure is appropriate for the Faculty. There has not yet been a faculty-wide discussion of the administrative structure of the Faculty of Engineering and the consequences of a change in structure.

Proposed Actions

Currently accreditation and the Engineering 2010 initiative to redesign the undergraduate curriculum is demanding a significant amount of time from faculty members and Discipline Chairs. Once the workload associated with these activities has subsided, the Faculty Management Group (FMG) will engage in discussion about an administrative structure that will be most appropriate to support the Faculty in moving forward with our academic programs, research and outreach.

Who: Dean and Faculty Management Group *When:* Fall 2005

Recommendation 1.2: The University should develop a means to recognize the individual performance of teaching/research units, such as the disciplines in the Faculty of Engineering. For example, CIAP should collect and publish statistics on teaching and research productivity, differentiated by discipline.

Faculty Response

There is agreement with this recommendation.

Proposed Actions

CIAP, the Office of Research and other units that monitor and report on measures of activity in the academic units will treat the individual disciplines within the Faculty of Engineering as they do departments in the departmentalized faculties.

Who: Dean and Director of CIAP *When:* Summer 2005

Recommendation 1.3: The University should develop means to recognize the interdisciplinary nature of much work done within the Faculty. For example, programs that fund interdisciplinary work should recognize such work within the Faculty.

Faculty Response

There is agreement with this recommendation.

Proposed Actions

The University administration will recognize, encourage and support interdisciplinary engineering programs and research in the same manner as interdisciplinary activities within other departmentalized Faculties.

Who: Dean and Vice-Presidents

When: Summer 2005

Recommendation 1.4: Further devolution of appropriate components of budget and academic controls to the discipline chairs is strongly encouraged. Such devolution will achieve the positive effects of departmentalization without the associated negative effects.

Faculty Response

There is qualified agreement with this recommendation.

As more management responsibilities are devolved to the Discipline Chair there may need to be changes in the nature of the Discipline Chair appointments (e.g. outside of bargaining unit, teaching loads).

Proposed Actions

The Dean will review the roles and responsibilities of the Discipline Chairs in consultation with the Vice-President (Academic) and the Director of Faculty Relations so that the roles and responsibilities are consistent with the recognition, compensation and authority associated with the Discipline Chair positions.

Who: Dean, Vice-President (Academic) and Director of Faculty Relations

When: Summer 2005

Recommendation 2.1: The Faculty must complete the teaching equivalency exercise as soon as possible so that graduate teaching and graduate student supervision is properly recognized as a component of the work load.

Faculty Response

This recommendation has already been acted upon as required by the timeframe specified in the new Collective agreement.

Proposed Actions

No further action is required.

Recommendation 2.2: The Faculty should develop a plan that identifies the staffing levels required to deliver the accredited undergraduate program. The plan should also identify the human resources necessary to support areas of research expertise and graduate study that the Faculty identifies. The development of this plan should be based on a process of open consultation within the Faculty, as well as between the Faculty, C-CORE and IMD. The University must recognize that with a progression from a primarily undergraduate teaching program to an integrated undergraduate/graduate program, more academic staff are essential.

Faculty Response

There is agreement with this recommendation.

Each Discipline has been asked to develop a hiring plan that reflects the research priorities of the discipline.

The Engineering Undergraduate Society is concerned that the strength of the Faculty in terms of graduating highly regarded undergraduate students not be lost as the Faculty becomes more research-oriented.

Proposed Actions

The Faculty is currently engaged Engineering 2010, in a major redesign of the undergraduate engineering programs at Memorial. This objective and timeframe for initiative was formally approved by Faculty Council in October 2004. One of the guiding principles of the Engineering 2010 initiative is that the undergraduate programs must be designed such that they can be delivered with the human and physical resources available within the faculty and in recognition of the increasing role of the Faculty in research. As the programs are designed by the Disciplines, each Discipline will develop a human and physical resource plan that allows the Faculty to fulfill our mission, which includes contributions in teaching, research and outreach.

Who: *Dean and Faculty Management Group* **When:** *Winter 2006*

Recommendation 2.3: The Faculty should develop a standard start-up funding package for new hires that is competitive with other Canadian universities. Typical packages across Canada range from \$20,000 to \$60,000.

Faculty Response

There is qualified agreement with this recommendation.

Such funds must be incremental to the current Faculty budget.

Proposed Actions

In the short-term, the Faculty will continue to work with the Vice-President (Research) during negotiations with prospective faculty members to ensure that the necessary start-up funding is available from sources outside of the Faculty operating budget. As opportunities arise to increase the operating funding available to the Faculty or for attracting donations or other external revenues, it will be possible to improve support for research, including start-up funds, within the Faculty.

Who: *Dean and Vice-President (Research)* **When:** *Ongoing*

Recommendation 2.4: The Faculty should ensure that every new academic staff member is supported in applying for a CFI New Opportunity Grant.

Faculty Response

There is agreement with this recommendation.

It is proposed that this support should include skilled resources to assist faculty members in preparing more competitive research proposals and in supporting/maintaining the equipment.

Proposed Actions

All faculty members recruited in the last 3 years have been encouraged and supported in their efforts to secure CFI New Opportunity awards. This has included significant financial support through the Vice-President (Research). In order to enhance the competitiveness of the research proposals and to support the development of a greater number of research proposals, the Faculty will work with the Vice-President (Research) to recruit an individual who can work with researchers to improve the application and success rates for research proposals.

Who: *Associate Dean (Graduate Studies and Research) and Vice-President (Research)*

When: *Summer 2005*

Recommendation 2.5: The Faculty should systematically investigate additional opportunities to collaborate with organizations such as IMD and C-CORE. This may require improvement of some facilities in Engineering, such as the geotechnical teaching and research laboratories, to enable the Faculty to take full advantage of these partnerships and the resources that they bring to the University.

Faculty Response

There is agreement with this recommendation.

In some disciplines there is already good research collaboration with NRC-IOT (formerly IMD) and C-CORE, and the Faculty of Engineering has brought forward opportunities (e.g. Chairs, shared appointments) to each of these organizations that would see better sharing of human resources that would support both teaching and research at Memorial. There remains an opportunity for faculty members to investigate research opportunities in collaboration with the outreach centres within the Faculty

Proposed Actions

The Dean will continue to meet regularly with the Director General of NRC-IOT (formerly IMD) and with the President of C-CORE to present and discuss opportunities for greater sharing of human and physical resources. Both of these individuals sit on the Engineering and Applied Science Advisory Council and the Dean of Engineering sits on the Board of Directors of C-CORE.

Who: Dean

When: Ongoing

Recommendation 2.6: The Faculty should aggressively pursue an overhead policy that encourages participation in contract-based research and development.

Faculty Response

There is qualified agreement with this recommendation.

Overhead revenues must be clearly seen to be reinvested into the activities (research, technical and support staff) of the Faculty and into relevant laboratory facilities that strengthen the resources available for teaching, and further contract and research activities.

Proposed Actions

The Faculty will have this matter considered by an ad-hoc committee that will identify ways in which initiatives within the Faculty (i.e. Ocean Engineering Research Centre, Industrial Outreach, Continuing Engineering Education) can encourage greater participation by faculty members.

Who: Dean, Assoc. Dean (Grad. Studies & Research), Director of CEE, Director of OERC

When: Fall 2005

Recommendation 2.7: We note that the Faculty has recently developed more detailed criteria for Promotion and Tenure in accordance with the collective agreement. We recommend that these criteria be revisited in order to make explicit the necessity for publication and graduate student training as essential components of research productivity.

Faculty Response

There is agreement with the recommendation.

Proposed Actions

No immediate action is proposed since the more detailed criteria have only been used for two years and the supervision of students on projects related to scholarly activity is an implied expectation and is a significant feature of the research programs for faculty members hired within the last 10 years. Also, Memorial's Collective Agreement (Clause 3.03) notes that the duty to engage in scholarly activity includes the dissemination of the work through means appropriate to the discipline.

Recommendation 2.8: Without devaluing the contribution of teaching staff, the Faculty should take full advantage of changes in the collective agreement with MUNFA to assign additional teaching to faculty who are not active researchers in order to provide teaching relief to new faculty members, with care being taken to ensure that the overall quality of teaching is not compromised.

Faculty Response

There is agreement with this recommendation.

Proposed Actions

The current Collective Agreement required academic units, beginning in 2003-04, to give a reduced teach load to faculty members during the first two years of a tenure track appointment (Clause 3.22). In addition, the provisions of Clause 3.18(b) have been used in the 2004-05 Academic Year to increase the amount of teaching by faculty members who are not active in research.

Who: Dean

When: Ongoing

Recommendation 3.1: A review of the graduate program, including curriculum and policies, completion rates, and graduate student morale, should be conducted at the earliest opportunity.

Faculty Response

There is agreement with the recommendation.

There are initiatives underway (e.g. revisions to minimum graduate student stipends) to address some of the issues that have been identified.

The Engineering Graduate Student Society (EGSS) notes that improvement student morale requires action by the EGSS as well as by the Faculty. With respect to completion rates, the EGSS concerns relate to the time to completion of M.Eng. theses and not only whether students complete their theses.

Proposed Actions

The Associate Dean (Graduate Studies and Research) will work with the Engineering Graduate Student Society (EGSS) to identify any areas of concern with respect to the issues raised in this recommendation. The need for a review will be assessed following the discussions with the EGSS and with the Graduate Studies Committee of Faculty Council.

Who: Assoc. Dean (Grad. Studies & Research) ***When:*** Summer 2005

Recommendation 3.2: New sources of student funding must be identified. The University should review the proportion of baseline funding for graduate student support allocated to Engineering to ensure that the Faculty receives its fair share in view of its recent growth in graduate enrollment.

Faculty Response

There is agreement with this recommendation.

The Faculty understands that there is a review of the baseline allocation underway at the School of Graduate Studies which will improve the graduate funding situation in the Faculty of Engineering.

Proposed Actions

No action is required since the baseline allocation formula has been changed so that funding is allocated based on the number of graduate students in each academic unit.

Recommendation 3.3: It is an obligation of a University to disseminate its research findings. Graduate students should be strongly encouraged to publish their research and the University should increase support to students presenting their work in national and international forums. This is the mechanism whereby continuation of research funding is ensured.

Faculty Response

There is agreement with this recommendation.

Proposed Actions

Revenues from the Master of Applied Science in Computer Engineering (MASCE) program have been used in 2004/05 to set up a travel fund for graduate students to provide some support to students who travel to present their work at national or international conferences. These are funds that are available to the Faculty from outside of the Faculty operating budget and continuation of the travel fund, and other similar initiatives, will continue subject to availability of funds.

Who: Assoc. Dean (Grad. Studies & Research) ***When:*** Ongoing

Recommendation 4.1: The Faculty should review the program with the goal of removing duplication between Terms A & B and Terms 1 & 2, and optimizing the effectiveness of these four terms in light of recent changes in the high school curriculum. Care must be taken that any revisions comply with the CEAB's current interpretations of Basic Science and Engineering Science, and that the present high quality of the educational experience afforded the students not be diluted.

Faculty Response

There is agreement with this recommendation.

Proposed Actions

The Engineering 2010 initiative that is underway will address the issue of removing duplication between Terms A&B and Terms 1&2 by developing a new common first year for the engineering programs and providing direct admission into Term 1 for most applicants from high school. Redesign of the programs will be done with an understanding of the CEAB requirements and with a view to creating programs that will receive strong accreditation assessments. Removal of duplication will require a revision to both the engineering and science courses and the cooperation of mathematics, physics and chemistry will be essential if effectiveness is to be optimized.

Who: Dean and Faculty Management Group ***When:*** Ongoing

Recommendation 4.2: CIAP should be asked to conduct a study of student success as a function of grades on admission after Term B. The results of this study should be the basis for future decisions regarding admission standards.

Faculty Response

There is general agreement with this recommendation.

Proposed Actions

Restructuring of the administrative staff is underway in order to provide more senior administrative support to the Office of the Associate Dean (Undergraduate Studies). This additional support will allow the Faculty to undertake studies of the type suggested in order to determine admission standards for the Engineering 2010 programs. A sub-committee of the Engineering 2010 Core Committee and the Admissions Committee of the Faculty are currently studying student success based on performance in Term 1 and certain Level III high school courses in order to determine admission criteria for Engineering 2010.

Who: Associate Dean (Undergraduate Studies) **When:** Fall 2005

Recommendation 4.3: The Faculty should determine the optimum enrollments in the undergraduate programs in the context of available human, physical and financial resources.

Faculty Response

There is agreement with this recommendation.

It is proposed that this assessment should be extended to consider the prospect for growth of the undergraduate enrollment and to identify the resources, including changes in program content and structure, that would be required in order to achieve this growth in a manner that ensures the quality of the undergraduate program and supports the research agenda of the Faculty.

Proposed Actions

This recommendation will be addressed in the development of a human and physical resource plan associated with the Engineering 2010 initiative.

Who: Dean and Faculty Management Group **When:** Ongoing

Recommendation 4.4: The Panel applauds the Faculty's initiatives aimed at allowing adequately prepared students to complete the program in less than six years. We encourage continued efforts to increase this kind of flexibility to the extent that it can be done without reducing the overall strength of the program.

Faculty Response

There is agreement with this recommendation.

Proposed Actions

Additional changes to fast-track admission requirements were implemented in June 2004 in order to encourage students with strong performance in AP mathematics to gain direct entry to engineering. An objective of the Engineering 2010 initiative is to offer accredited co-op engineering degree programs that adequately prepared students will be able to complete in 5 academic years.

Who: Assoc. Dean (Undergrad. Studies) **When:** Fall 2005

Recommendation 4.5: Consideration should be given to making better use of teaching staff in other Faculties to allow more flexibility within the Faculty of Engineering.

Faculty Response

There is agreement with this recommendation and this is already happening in certain parts of our programs.

Proposed Actions

This recommendation will be addressed in the development of the core and discipline programs in the Engineering 2010 initiative.

Who: Dean, Assoc. Dean (Undergrad. Studies) ***When:*** Fall 2005

Recommendation 4.6: The Faculty should aggressively pursue funding, from all possible sources, to renew the computer and laboratory equipment.

Faculty Response

There is agreement with this recommendation.

Proposed Actions

A multi-year plan for investment in equipment and facilities related to teaching has been approved by the Vice-President (Academic). The plan proposes shared investment by the Faculty and the University to support approximately \$250K of equipment and facilities renewal in each of the next 3 years. In addition, agreement will be sought with the senior administration to ensure that there is appropriate funding available to the Faculty from any additional revenues (e.g. tuition fees, increased government grant) that may become available to Memorial. The Faculty has also made fundraising in support of improving facilities an action item for the Engineering and Applied Science Advisory Council (EASAC) and the Memorial Engineering Alumni Advisory Committee (MEACC).

Who: Dean, Vice-President (Academic) ***When:*** Ongoing

Recommendation 4.7: The Faculty should reconsider the list or lists of courses available as complementary study electives. By properly structuring these offerings, it should be possible to meet both the requirements of CEAB and the desire of students for more flexibility. The Faculty is strongly advised to consult with CEAB to ensure that any changes conform to CEAB criteria.

Faculty Response

There is agreement with this recommendation.

Proposed Actions

Changes to the complementary studies component of the engineering program which address the above recommendation have been proposed and approved by Senate for implementation starting in the 2005-2006 academic year. One of the guiding principles of the Engineering 2010 initiative is to develop programs that offer students greater flexibility with respect to program content. A sub-committee of the Engineering 2010 Core Committee has been established to review the complementary studies component of the re-designed program.

Who: Assoc. Dean (Undergrad. Studies) ***When:*** Summer 2005

Recommendation 4.8: The Faculty should strengthen professionalism and ethics instruction through a possible expansion of current work term seminars, a series of lectures, a web-based program of study, or a mandatory course module.

Faculty Response

There is agreement with this recommendation.

While there is some instruction about professionalism and ethics as part of the professional development (PD) seminars that are presented to students at various points in their programs, there is a question as to

whether or not students take this instruction seriously if the material is not examined. Instruction in this area should also deal with gender issues.

Proposed Actions

The Engineering 2010 Core Committee has proposed a 1 credit-hour mandatory course to provide instruction on professionalism and ethics, equity and workplace issues. In addition, as part of the recent changes to the complementary studies component of the program, an existing course on Engineering Profession, has been re-introduced as a mandatory course. The course will examine values in the profession, history, ethics, gender issues, sustainable development and the place of engineering in society. These changes should strengthen professionalism and ethics in the program.

Who: Assoc. Dean (Undergrad. Studies)

When: Summer 2005

Recommendation 5.1: The Panel supports the mandatory co-op format.

Faculty Response

There is agreement with this recommendation.

There needs to be a focus on job development and a review of the resources required to maintain a mandatory co-op format at a time of increased enrollments in our programs and increased competition from other institutions for placements.

Proposed Actions

One of the guiding principles of the Engineering 2010 initiative is to maintain the mandatory co-op format. No further action is required.

Recommendation 5.2: The Panel considers six work terms to be a strength of the program. Nonetheless, we encourage the Faculty of Engineering to review Co-op models elsewhere to see if they offer ideas for possible improvement. In particular, consideration should be given to a detailed definition of the learning objectives for at least one of the earliest work terms.

Faculty Response

There is agreement with parts of this recommendation.

The Faculty needs to review our co-op model within the context of an overall review of the content and structure of the undergraduate programs. While the current co-op structure is primarily a result of the design of the academic part of the program and the overall length of the program, the required number of work terms should come out of the overall program review. Alternative program formats should not be constrained by a six work term requirement.

Performance, professional and personal learning objectives are developed and written up for each work term.

Proposed Actions

The program structure approved for the Engineering 2010 initiative includes 6 4-month slots that are not associated with academic terms or which have sufficient flexibility that they could be all used for work terms. The normal requirement will be that students complete 4 work terms. Faculty Council has approved a set of professional and communication objectives for the work term component of the program and an Engineering 2010 Co-op Committee has been formed to develop the co-op component of the new program.

Who: Dean and Faculty Management Group

When: Fall 2005

Recommendation 5.3: The work term reports offer an excellent opportunity for students to develop their writing skills. The Faculty should take advantage of the resources of the Writing Centre and the potential contribution of retired engineers to enable feedback on and rewriting of work term reports to maximize the effectiveness of instruction in technical communications. The Faculty should consider possible advantages of numerical grades rather than pass/fail.

Faculty Response

There is agreement with this recommendation.

The Faculty, through the Undergraduate Studies Committee, considered alternatives to the pass/fail grading system for work terms and submitted a proposal for consideration by the Registrar's Office. This proposal was referred back to the Faculty for further consideration and for consideration by other co-op programs.

The Faculty has a work report evaluation program that draws on the skills of retired engineers in the local community.

Proposed Actions

The issue of whether the pass/fail grading system should be maintained or changed to numerical grading of work terms has been referred to an ad-hoc committee of which is considering the issue on behalf of the University. The Faculty will retain the current pass/fail grading system until an alternative grading mechanism is approved. The PEG-NL Work Report Review Panel will be maintained and expanded to include additional members.

Who: Assoc. Dean (Undergrad. Studies), Program Manager of Co-op

When: Summer 2005

Recommendation 5.4: The Faculty should consider having the Program Manager, Co-operative Education report to the Associate Dean (Undergraduate). We believe that this would facilitate communications between the co-operative education activities and the remainder of the undergraduate program.

Faculty Response

There is agreement that there should be better integration between the Office of the Associate Dean (Undergraduate Studies) and the Office of Cooperative Engineering Education. For example, there is scope for consolidating student records into a single filing system and for improving communication with students about their undergraduate programs, both the academic and work term components.

The recommendation to change the reporting structure may be problematic to implement from the perspective of the Collective Agreement and is not necessary in order to achieve the benefits of better integration and communication.

Proposed Actions

The University will recruit a permanent Director of Co-operative Education in 2005. The Director will undertake a review of the organizational structure of co-op in order to identify a structure that ensures that co-op is effectively and efficiently administered and delivered to each of the academic units that offer co-op education.

Who: Dean, Director of Co-op Education

When: Fall 2005

Recommendation 5.5: The mandate for the Director of Co-operative Education and Academic Experiential Learning should be clarified and communicated to the University community as soon as possible. The University should take care to ensure that this office does not duplicate the

work of Co-op staff within individual units, but rather provides services that complement and facilitate their work.

Faculty Response

There is agreement with this recommendation.

There is a need for a highly credible and dynamic spokesperson and promoter of co-operative education with the local, national and international community. Resources available to support co-op should be deployed in a manner that improves the ability of the Faculty of Engineering to offer our co-op programs.

Proposed Actions

See actions noted for Recommendation 5.4.

Recommendation 6.1: The Faculty should systematically explore opportunities to share courses and research programs with other Faculties and Departments across the University.

Faculty Response

There is agreement with this recommendation.

There is scope for greater sharing of equipment resources among faculty members and between research and teaching within the Faculty.

Proposed Actions

The Faculty is actively pursuing opportunities for collaboration with other academic units in teaching and research. Examples of recently collaborations include the CRC Chairs in Application Specific Circuit Design, Photonics, and Music Technology, the Husky Chair in Oil and Gas Engineering, as well as the sharing of courses and resources between Engineering, Computer Science, Earth Science, Math and Physics.

Who: Dean and Associate Deans

When: Ongoing

Recommendation 6.2: When current professors in Engineering whose primary duty is the teaching of mathematics courses retire, consideration should be given to having these courses taught in the Faculty of Science and replacing these positions in the Faculty of Engineering with faculty whose teaching and research can strengthen its capacity in engineering disciplines.

Faculty Response

There is qualified agreement with this recommendation.

The positions must remain within the Faculty of Engineering for reallocation to the Disciplines to strengthen engineering research and teaching capacity. There needs to be assurances that the quality of the instruction provided to our students through service teaching will be of the same high standard as provided by the mathematics instructors in the Faculty of Engineering. Also, since the course context is planned and delivered in the context of our overall engineering programs, there needs to be close coordination between the Faculty of Engineering and the Department of Math in planning, revising and delivering math courses for engineering students.

Proposed Actions

As faculty members who have primary responsibility teaching mathematics retire, the Faculty will consider the recommendation as it determines the nature of the replacement position.

Who: Dean and Discipline Chairs

When: As opportunities arise

Recommendation 6.3: The University must seek ways to resolve the issues of space shortage in both the Faculty of Engineering and the Department of Computer Science.

Faculty Response

There is agreement with this recommendation as it relates to the Faculty of Engineering.

The Faculty of Engineering is not in a position to comment on space shortages affecting the Department of Computer Science.

Proposed Actions

The space challenges facing the Faculty are significant and there are no laboratories for new faculty members who have been successful in securing CFI funding. In addition, additional sections of Term 1 courses were required in Fall 2004 since no classrooms were available that would allow for the teaching of large first-year engineering classes. Opportunities to bid for additional space (e.g. space freed up in the Alexander Murray Building by the expected move of the School of Graduate Studies to the INCO Innovation Centre) have been made. A “space committee” has been formed within the Faculty in order to advise on and adjudicate requests for office and laboratory space within the Faculty.

The University will work with the Faculty to carry out a space utilization study and develop a plan for improving the teaching and research space available to faculty, staff and students in engineering.

Who: Dean, Engineering Space Committee and Facilities Management

When: Fall 2005