

## **Senate Committee on Academic Development** Report to Senate - Meeting of February 5, 2014

### **Proposal to add a field (Industrial Internship) in the Master of Engineering Program, Department of Electrical and Computer Engineering**

#### **Introduction**

The proposal to add an Industrial Internship field in the Master of Engineering, Department of Electrical and Computer Engineering was reviewed by the Senate Committee on Academic Development (SCAD) at its meeting on February 5, 2014. S. Yam, (Associate Dean, International and Special Projects) attended the meeting to speak to the proposal and answer questions from Committee members. Members of SCAD were provided with the Expedited Approval Submission Form for the proposed new field in the MEng, Department of Electrical and Computer Engineering.

#### **Analysis and Discussion**

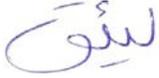
The following should be noted:

- introduction of the 4-8 month internship will provide the opportunity for experiential learning at the graduate level in the MEng program within the Department of Electrical and Computer Engineering;
- the paid industrial internship opportunity is available to both domestic and international students;
- the internship will provide students with the opportunity to network with potential employers while at the same time gain valuable work experience;
- the structure of the graduate internship has been modelled on similar undergraduate professional internships within the Faculty of Engineering and Applied Sciences;
- for a registration fee of \$35 per student, Career Services will manage the non-academic aspects of the internship;
- participating students will be assigned both an academic supervisor and an workplace supervisor who will work together to guide and assess the student's performance.

**Motion**

**that Senate approve the addition of an Industrial Internship field in the existing MEng program in the Department of Electrical and Computer Engineering effective September 2014.**

Respectfully submitted,



Laeque K. Daneshmend, PhD, DIC  
Chair, Senate Committee on Academic Development

**Committee Members:**

H. Abdollah, Medicine  
L. Anstey, PhD'15, Education  
L. Daneshmend, Deputy Provost (Chair)  
I. Duchaine, BAH'14 (History)  
J. Emrich, Faculty of Law

A. Gill, BCom'15  
D. Hutchinson, Geo Sciences & Geo Engineering  
A. Jack-Davies, Health Counseling & Disability Services  
K. McAuley, Chemical Engineering  
P. Oosthuizen, Academic Colleague



## GRADUATE PROGRAM - MAJOR MODIFICATION PROPOSAL

### *Expedited Approval Submission Form*

This template is to be used when seeking approval for a Major Modification of an existing Graduate Program. Major modifications must receive the approval of the Graduate Studies Executive Council (GSEC) before being submitted by the Provost's Office to the Senate Secretariat for referral to the Senate Committee on Academic Development (SCAD) which will then make their recommendations to Senate. Academic Units are strongly advised to contact the Director of the Office of the Vice-Provost and Dean SGS or the appropriate Associate Dean in the SGS with any questions that arise during this proposal development. Refer also to the QUQAPs website at: <http://www.queensu.ca/provost/responsibilities/qualityassurance.html>.

**NOTE: the textboxes in this template will expand as needed.**

### Part A – General Summary

Name of Existing Program:	Master of Engineering in ECE
Academic Unit(s):	Department of Electrical and Computer Engineering
Proposed Implementation Date:	September, 2014

Contact Information (1)		Contact Information (2)	
Name:	Il Min Kim	Name:	Scott Yam
Title:	Associate Professor	Title:	Associate Professor
Unit:	Department of Electrical and Computer Engineering	Unit:	Department of Electrical and Computer Engineering
E-mail:	<a href="mailto:llmin.kim@queensu.ca">llmin.kim@queensu.ca</a>	E-mail:	scott.yam@queensu.ca

Nature of Modification:	CHECK all that apply
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Creation or deletion of a Graduate Field

*Specify: addition of the field ECE with Industrial Internship*

Introduction or deletion of a research project, research essay or thesis, course-only,  
internship or practicum option (*Master's level*)

**Description of Existing Program, Nature of the Major Modification, and Rationale for Proposed Change**

*Briefly summarize (suggested 1-page maximum) the existing Program to be modified, the nature of the proposed Major Modification, and the rationale for the modification.*

The proposal is to introduce a 4 to 8 month industrial internship as the project in the existing MEng program in ECE. This is considered to be a major modification as it involves a new field which will appear on the transcript as “MEng in ECE with Industrial Internship”.

While industrial internships have long been an integral part of engineering education in other parts of the world (e.g. Germany, UK), they are only now becoming an important training component at the graduate level in North America, where students gain on-the job experience in a specialized discipline, opportunity to network with hiring managers, and financial compensation for tackling engineering problems of industrial interest. It is also a good opportunity for employers to screen for suitable future employees. At Queen`s, the internship process is supported by the QUIP program at the undergraduate level, facilitated by Career Services, where interested students and employees are matched. As employers are looking for employees that are increasingly skilled and specialized in a knowledge intensive economy, the internship will play a significant role in experiential learning at the graduate level.

The Faculty of Engineering and Applied Science (FEAS) has been working with Career Services on campus to extend the internship program to the graduate level. While this service can be made available to domestic graduate students pursuing Master of Engineering degrees with minimal administrative hurdle, this is not the case for international M.Eng. students, as their visa status would allow them to work off campus at the sites of local industries, only if the internship is an essential part of their training. Hence, in order for both domestic and international M.Eng. students to benefit from the same experience, a new field (M.Eng. in ECE with Industrial Internship) is to be introduced, where the internship is a necessary training component for students interested in experiential learning.

The internship for the new field for the M.Eng. in ECE is anticipated to be 4 to 8 months in duration, based on availability and interest of both the students and employers. The matching process will be conducted by the Careers Services at Queen`s, who has been performing similar function for Queen`s undergraduate engineering students through QUIP. The introduction of this new internship is anticipated to attract international students to Queen`s FEAS who are interested in Canadian work experience. Upon completing the M.Eng. degree, they will be connected with local Canadian industry that are looking for skilled technical workers. There has also been quite a few proposals in the last six months from various international institutions to work with Queen`s FEAS based on a 3+1+1 model, where international students would spend their first 3 years in their local university, and the last year at Queen`s FEAS taking technical electives, and gaining a undergraduate degree from their local institution. The qualified students would then have the option of spending one more year at Queen`s FEAS, pursuing the M.Eng. degree, with the further possibility of gaining Canadian work experience. This initiative not only provides genuine value proposition to the students, but increases the diversity on the Queen`s campus, while bringing in revenue both at the undergraduate and graduate level, especially into undergraduate programs that are under subscribed (e.g. ECE).

The only resource implication is that there will be a cost recovery component with Career Services

who will be hiring an extra person who will spend a percentage of his/her time on this initiative. Following the undergraduate internship model, cost recovery will be in the form of a registration fee (currently set at \$35). See Appendix B for further details.

The original proposal was approved by FEAS Graduate Council on October 23, 2013, and by the Department of Electrical and Computer Engineering on November 21, 2013.

## Part B – Evaluation Criteria

To facilitate evaluation of the proposal for a Major Modification of an existing Graduate Program, only the relevant textboxes below need to be completed (consult with the School of Graduate Studies to confirm the information required). Academic Units should refer to the New Graduate Program template

<http://www.queensu.ca/provost/responsibilities/qualityassurance/DocumentsandLinks/Templates.html> for details regarding the Sections and Tables in that template that need to be completed as specified and imported into the relevant Sections below. Academic Units should bear in mind the diverse groups (e.g. GSEC, SCAD, Senate) that will be reviewing their submission and prepare their proposal accordingly.

### Creation of a New Graduate Field

**Information required:** *Appropriateness of proposed designation [Section 1.5], comparison with other similar programs, describe consultative process including consultation with current students, impact on current students, timeline for implementation and grandfathering (note: Registrar's signature required in Part C)*

The current Master of Engineering (MEng in ECE) is completed by coursework (8 courses) or 6 courses plus a term-length on-campus project that counts as 2 courses. The addition of the new field (MEng in ECE with Industrial Internship) is needed to provide students with the opportunity to use an off-campus industrial project as academic credit towards their MEng degree. This will be of great interest to both international and domestic students whose objective upon graduation is to join the job market. With the industrial internship as a degree requirement, Career Services can become involved to assist students in job placement for the internship. The proposed new field does not negatively impact current students, and does not conflict with the current designations.

**Introduction or Deletion of a Research Project, Research Essay or Thesis, Course-only, Internship or Practicum Option  
(Master's Level)**

**Information required:**

Introduction: *describe the nature and appropriateness of the requirement [Section 9.4]; how the requirement contributes to the relevant Degree Level Expectations and identify associated learning outcomes [Section 3.2, including Table 1]; indicate the timeline for degree completion [Section 3.5] and methods of monitoring progress [Section 3.7]; describe the research funding available in support of the research requirement [Section 8.6 including Table 6].*

The proposed MEng in ECE with Industrial Internship normally consists of 8 months of coursework (6 courses) plus an 8 month paid industrial internship. If the internship is only 4 months in duration, then the student should take 7 courses in the initial 8 month period. .

Unlike domestic students, international students who recently arrived in Canada often lack the social network and community support when looking for their first full-time employment upon graduation. This initiative provides a structure to facilitate this process. Also, there have been many institutions who have proposed to work with Queen`s FEAS on the 3+1+1 model (see executive summary) recently: 2 from China, 1 from Taiwan, 1 from Singapore, and 1 from India.

With the exception of the new industrial internship courses (descriptions in **Appendix A**), students enrolled in the program will be taking existing graduate level courses offered in ECE. Hence, there are no additional resource implications from a Department perspective. However, there are resource implications from the Career Services perspective.

Career Services will be responsible for facilitating internship match-up between enrolled students and potential employers, with procedures similar to the QUIP program, which is the undergraduate equivalence of industrial internship. The duration of internship training can vary between 4 to 8 months, based on the mutual desire of both the students and the employers. Although the exact working details have not yet been finalized between FEAS and Career Services, it is anticipated that the registration fee for cost recovery will be on the order of \$35 per student (following the undergraduate internship model).

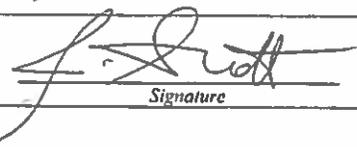
There is only one MEng program in ECE. But there are four possible routes to completion. The different routes of the M.Eng. and the corresponding expectations will be clearly outlined to the students in the letter of offer, for a September start. Students who wish to take the internship route beginning in the Winter term require the graduate chair`s permission. The job matching process with Career Services begins in the Fall term. Students will find out the matching results by the beginning of the Winter term. At that time, students may decide not to stay in the internship route, and instead opt for one of the other routes and still ensure program completion in 8 to 12 months.

FEAS is working with Career Services to provide human resources to periodically interact with student interns and their workplace supervisors in order to monitor both progress and the training experience provided to the student. The process starts with a detailed job description of the internship position. Both the employer and the student are encouraged to refer to this description on a regular basis as a measure of progress. Periodic interaction will include (but not be limited to) feedback via email and workplace visits.

## Part C - Authorizations

The date of Faculty Graduate Council/Committee approval is to be included prior to submission to GSEC, the remainder of Part C will be completed, as appropriate, by the SGS following GSEC approval, prior to submission to SCAD

**Note:** additional authorizations may be required depending on the nature of the proposed Major Modification [refer to Part B]

<i>Date approved by Department</i>	November 21, 2013	
<i>Date approved by Faculty Graduate Council</i>	October 23, 2013	
<i>Date Approved by GSEC</i>	<u>Jan. 16, 2014</u>	
<i>Vice Provost and Dean, School of Graduate Studies</i>	 <i>Signature</i>	<u>Jan 24, 2014</u> <i>Date</i>
<i>Provost and Vice-Principal (Academic)</i>	 <i>Signature</i>	<u>28 01.14</u> <i>Date</i>
<i>Date Approved by SCAD</i>	_____	

## Appendix A

The Master of Engineering Degree with Industrial Internship in ECE requires students to take six term-length lecture-based courses, up to two of which can be fourth-year undergraduate courses. In addition, internship students take two term-length internship project courses (ELEC 895 and ELEC 896), for a total of eight courses. They must also take the (non-credit) seminar course ELEC-891. Further, the courses must be selected as follows:

- (1) ELEC 895 and ELEC 896
- (2) At least two term-length graduate courses must be courses offered in the Department
- (3) Normally, the remaining lecture-based courses may be chosen from courses listed by the Department, or from courses offered by another department in Queen's University, or from the Royal Military College.

If a student decides not to take ELEC 896, then they must take a total of seven term-length lecture-based courses. This situation could arise for example if the duration of the internship job was only 4 months.

### *Calendar Descriptions of New Courses*

#### **ELEC 895 Industrial Internship I**

The industrial internship involves spending a minimum of 4 months and a maximum of 8 months in a paid internship position in industry, government, or other suitable employment opportunities. Students in the 4 month internship must register in ELEC 895. Students in the 8 month internship must register in ELEC 895 and ELEC 896. Successful completion of the course requires submission of a report on the industrial project within thirty days of completion of the work period. Each project must be approved by the academic supervisor. Career Services manages the non-academic aspects of the course.

#### **ELEC 896 Industrial Internship II**

See ELEC 895.

### *Description of M.Eng. Project Report*

A project must be expressed in a suitable form in a format for a technical report and written in good English. The report should display a scholarly approach to the subject and demonstrate that the candidate has a thorough knowledge of the topic. A critical review of previous work related to the subject should be given. The objectives and contributions of the project should be clearly stated. The work done must be viewed as equal to the work of two graduate courses (ELEC 895 and 896) and beyond the work of an undergraduate fourth-year project. The report is to be evaluated by the supervisors(s) and two other examiners. The majority of the examiners must recommend a pass.

### *Workplace Supervisor Responsibilities*

The responsibilities of the workplace supervisor are as follows:

- Meet with the student early in the internship period to discuss expectations and what the student hopes to learn and accomplish while on the internship;
- Work with the student to design and set internship objectives;
- Meet with the student regularly to discuss their research internship and offer direction;
- Support and even possibly train the student in some facet of the internship to ensure success;
- Complete a midterm and final evaluation of the student's work, measured against his/her internship objectives; and
- Provide a signed final report of the internship

## **Appendix B**

### ***Procedures for MEng in ECE with Industrial Internship:***

The procedures for the MEng in ECE with Industrial Internship are similar to those for the Undergraduate Professional Internship in FEAS with one important difference:

- The undergraduate internship is a minimum of 12 months and maximum of 16 months. The graduate internship is minimum of 4 months and maximum of 8 months.

In both cases during the actual internship, students enrol in one course per term, register as part-time students, pay reduced or part-time tuition fees and work full-time in industry.

In addition to the industrial experience for which the intern earns a salary, workshops are offered on resume preparation, interviewing, work performance, and employer expectations. Successful completion of the internship requires submission of a formal report or presentation of high quality on the experience at the completion of the work period, and a satisfactory assessment of the intern's performance by the Employer.

Career Services manages the non-academic aspects of the course. Job openings under this program are posted by Career Services beginning in late October.

Students apply to the MEng program in ECE in the normal fashion. In the majority of cases, they start in September and all MEng students take four courses in the Fall term. Students who wish to switch to the Industrial Internship Field for the Winter term, must obtain permission from the department Graduate Coordinator to enrol in ELEC 895. Once this permission is obtained, students must register with Career Services and pay the registration fee (anticipated to be on the order of \$35 per student). Registration with Career Services provides students with access to the posted job openings.

Employers review all applications submitted and send an interview list to the Internship Office. Most interview requests will be sent to students via email directly from the QUIP Coordinator.

When all interviews are completed, employers will rank the students interviewed and send job offers to the Internship Office. Every student with an offer will be personally contacted by the Internship Office and all offers will be presented at the same time. Students must decide on offer(s) within 48 hours or forfeit them to the next student.