



## MEMORANDUM

**To:** Executive Committee of Faculty Council (November 3, 2016)  
Faculty Council Meeting (December 1, 2016)

**From:** Professor Jonathan Rose  
Associate Dean, Cross-Disciplinary Programs (Acting)

**Date:** October 24, 2016

**Re:** Undergraduate Academic Certificate in Forensic Engineering

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### REPORT CLASSIFICATION

This is a major policy matter that will be considered by the Executive Committee for endorsing and forwarding to Faculty Council for vote as a regular motion (requiring a simple majority of members present and voting to carry).

### BACKGROUND

The Office for Cross-Disciplinary Programs proposes a new Certificate in Forensic Engineering. As with other certificates, the Certificate in Forensic Engineering will require considerable commitment from students to complete three courses, or half a minor. Successful completion of the certificate will appear on the student's academic record.

Flexibility of the proposed certificate will allow students to develop their forensic engineering expertise around particular sub-fields of interest in forensic engineering practice. As such, we propose that three of the courses listed below – selected for their relevance to our students and to the objective of the certificate – will constitute the certificate. All of the numbered courses currently exist in the curriculum.

### OBJECTIVE OF THE CERTIFICATE IN FORENSIC ENGINEERING

The Certificate in Forensic Engineering will create a unique opportunity for interested students to gain specialized expertise and recognition for a personal and professional commitment to enhanced engineering investigation skills. Forensic engineering has traditionally been associated with the investigation of artifacts that fail or do not operate/function as intended, causing personal injury and/or monetary loss, the consequences of which are normally dealt with in a court of law. Forensic engineering training, however, goes well beyond the expert witness in the courtroom. Forensic engineering skills are highly valuable in other activities such as: assessment of deterioration in infrastructure, product quality and procedural practice improvement as a

result of investigations, direct impact on improving engineering design practices and revision of codes/standards to improve public safety.

### **VALUE TO THE FACULTY**

In 2011, Professional Engineers Ontario (PEO) embarked on developing a formal guideline to enhance the general understanding of forensic engineering, defining consistent and ethical practice, specifying scopes of work for clients and understanding of the role of expert witness testimony ([http://www.peo.on.ca/index.php/ci\\_id/20282/la\\_id/1.htm](http://www.peo.on.ca/index.php/ci_id/20282/la_id/1.htm)).

In November 2015, the PEO Guideline for Forensic Engineering Investigations was approved, a first in Canada ([http://peo.on.ca/index.php/ci\\_id/29496/la\\_id/1.htm](http://peo.on.ca/index.php/ci_id/29496/la_id/1.htm)).

The Faculty continues to offer the first and only degree-level course in forensic engineering (MSE 431H) in Canada. Since forensic engineering is a part of professional engineering practice that intersects all disciplines of engineering, a Certificate in Forensic Engineering creates an opportunity for interested students to benefit in a tangible way by developing investigation skills beyond the required foundation of our existing programs. As such, it can strengthen our relationships with employers as well as create an opportunity for recruitment of broad-based engineering students.

### **STRUCTURE**

To achieve the Certificate in Forensic Engineering, students must successfully complete a minimum of three one-semester courses from the list below:

#### Core Course:

Forensic Engineering (MSE 431H1 S)

#### Elective Courses: (choose two)

Making Sense of Accidents (APS5XXH1 S) (CS elective)

Engineering Materials (CHE341H1 F)

Environmental Engineering (CHE467H1 F)

Risk Based Safety Management (CHE561H1 S)

Environmental Impact and Risk Assessment (CIV440H1 S)

Solid Mechanics II (CIV510H1 S)

Fracture and Failure Analysis (MSE 419H1 F)

Quality Control and Improvement (MIE346H1 S)

Machine Design (MIE442H1 F)

Reliability and Maintainability Engineering (MIE 469H1 S)

### **PROCESS AND CONSULTATION**

The Undergraduate Curriculum Committee is composed of representatives from each program; the Vice-Dean, Undergraduate Studies; the Chair, First Year; the Associate Dean, Cross-Disciplinary Programs; and the Registrar's Office. The Committee meets regularly, and reviews changes to the curriculum.

**PROPOSAL/MOTION**

THAT the Undergraduate Academic Certificate in Forensic Engineering be approved and introduced in the 2017-2018 academic year.