



To: Faculty Council

From: Dr. Graeme Norval  
Chair, Undergraduate Curriculum Committee

Date: March 1, 2011 for March 8, 2011 Meeting

Item: Proposed Curriculum Changes for the 2011-2012 Academic Year

**Background:**

A number of minor curriculum changes are being proposed for the upcoming academic year.

**Structure:**

Chemical Engineering

The issue of student contact hours in 2<sup>nd</sup> and 3<sup>rd</sup> year chemical engineering was raised in the Faculty Self Study (April 2010); the data from Table 3.3 is reproduced below.

Contact Hours in Years 1 Through 4

Program	Year 1	Year 2	Year 3	Year 4 Average	
CHE	24	32.25	32.87	25	28.5
CIV	24	30	32	17	25.75
ECE	24	28	24.2	22.25	24.62
EngSci	26.75	29.25	25	22	25.75
IND	24	25	25	25	24.75
MEC	24	26.5	27	25	26.62
MIN	24	21	19.5	17.5	20.5
MSE	24	25	24.5	24.5	24.5
Track one	24	-	-	-	-
Average	24.3	27.12	26.25	22.3	25

This issue was also flagged in the recent Departmental Self Study, and discussed with the Departmental reviewers during their recent visit.

Some minor changes were introduced in the fall. It is now proposed to eliminate the requirement for a technical elective in term 3S. The students will continue to have 6 technical electives (down from the current 7), and the ability to complete all current minors. The program still greatly exceeds the CEAB minimum requirements as demonstrated in the Minimum Path below

### TABLE 2C.5 - SUMMARY

Prepare one summary for each option, otherwise one summary per program.

PROGRAM: Chemical Engineering

OPTION: Regular

Table	Item	5 Total AU	CURRICULUM COMPONENTS						
			6 Math + BS	7 Math	8 Basic Science	9 Comp. Studies	10 Eng'g Science	11 Eng'g Design	12 ES+ED
2C.3A	Compulsory Courses (hourly)	1585.3	643.5	254.4	389.1	142.4	554.9	244.5	799.4
2C.3B	Compulsory Courses (proportionally)	103.6	0.0	0.0	0.0	0.0	0.0	103.6	103.6
2C.3C	Option Compulsory	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2C.4	Electives	395.2	198.4	0.0	198.4	144.0	52.8	0.0	52.8
	<b>TOTAL</b>	2084.1	841.9	254.4	587.5	286.4	607.7	348.1	955.8
	<b>PRIOR STUDIES, (if claimed)</b>								
	<b>PROGRAM TOTAL</b>	2084.1	841.9	254.4	587.5	286.4	607.7	348.1	955.8
	<b>CEAB REQUIREMENTS</b>	1950.0	420.0	195.0	195.0	225.0	225.0	225.0	900.0

## Civil Engineering

1) Retain CIV575F for Graduate Students and Engineering Science – Energy Systems  
Two years ago, this core 4<sup>th</sup> year course was moved into third year as CIV375H1F, and temporarily also retained as CIV575F to serve fourth years students and graduate students in the transition. There is also a need for a similar, but more advanced, course to serve both graduate students as well as fourth year students in the Energy Systems Option in Engineering Science. It is proposed to offer a revised CIV575F (with a new title and description as shown below), with a joint exclusions between CIV375F and CIV575F; the lectures, but not tutorials, would be given jointly.

### **CIV575H1F Studies in Building Science**

IV – AEESCBASEI, AEESCBASEJ

3/-/2/0.50

This course examines the basic principles governing the control of heat, moisture and air movement in buildings and presents the fundamentals of building enclosure design. With this background, students are required to research advanced topics related to emerging areas of Building Science, and to write and present to the class an individual comprehensive paper related to their research. Lectures will be joint with CIV375H1.

Exclusion: CIV375H1

2) Introduction of a 4<sup>th</sup> Year Elective

Structural engineers need clear understanding on dynamic behavior of structures to safely and economically design structures subjected to winds, earthquakes, or any other types of dynamic loads. Hence, for undergraduate students who want to specialize in structures, the course will provide fundamental concepts on structural dynamics. The course will complement existing structural courses in the undergraduate program. In the graduate program, three new courses in the field of structural dynamics and earthquake engineering will be offered starting 2011-2012 academic year. The proposed course will be a basis (and prerequisite) of the four graduate level courses.

### **CIV 5XX H: Introduction to Structural Dynamics**

3/-/1/0.50

The concept of dynamic equilibrium and corresponding equation of motion will be introduced. The theoretical solution of a single degree of freedom system will be derived and the effects of various types of loads, such as impulse load, sinusoidal load, or random vibration, on the structural response will be discussed. To solve dynamic problems of multi-degree of freedom (MDOF) systems, concepts of mass, stiffness, and damping matrix will be introduced, which will be followed by eigen value analysis and modal analysis. The concepts of Fourier Transformation will be introduced, which will be used to interpret dynamic responses of structures or dynamic nature of applied loads. Dynamic experiments of elastic systems will be demonstrated using an educational shaking table.

Prereq. CIV 312 and CIV 313 or equivalent

100% Engineering Science

### 3) Cancellation of 2 Technical Electives

It is proposed to delete two courses that were initiated with the hiring of a new professor, who is no longer at the university.

- CIV427H1F Fundamentals of Geomatics Engineering:  
Civil Engineering, Mineral Engineering &  
Engineering Science Energy Systems and Infrastructure Engineering Options
- CIV428H1 S Geomatics Engineering II:  
Civil Engineering

### 4) Deletion of a Course Code

MIN429 and CIV529 (Rock Engineering) are equivalent courses taught together, and the material is no longer considered appropriate for graduate students. MIN429, which is a third year core course in the Mineral Program, would replace CIV529 as a fourth year technical elective in the Civil program.

## Engineering Science

Several years ago, the physics option split its elective courses into three lists - A, B and C with the requirement that students could take electives from list A in year 3, and courses from lists A, B and C in year 4 (with a minimum requirement of electives from list B).

It has been determined that three separate lists are not needed, two would suffice. It is proposed that lists A and C be combined into a new list A. The B list still makes sense.

It is proposed to change the structure of CSC180F, Introduction to Computer Programming, and CSC192F, Computer Programming – Algorithms, Data Structures and Languages, from 3/2/1, to 3/3/0, similar to CSC190S Computer Algorithms, Data Structures and Languages.

The course descriptions for BME 340 and BME 440 “Biomedical Engineering Technology and Investigation” are to be changed to more accurately reflect the content.

An introduction to the principles of fundamental technologies used in biomedical engineering research including but not limited to tissue culture, protein assays or colourimetric enzymatic-based assays, spectroscopy, fluorescence microscopy, PCR, electrophoresis, DNA manipulation and transfection. Since these technologies enable the investigation of a wide range of research questions with important clinical implications, the main focus of the course is learning these technologies while subsequent application within the lab will allow evidence-based investigation into specific research questions. Scientific literature (both good and bad) pertaining to each technology will be reviewed as examples of conducting investigations.

## Mineral Engineering

Students of the Lassonde Mineral Engineering program are required to take a geological mapping course. Currently the Geology Department offers two courses (GLG340 and GLG445), with students being arbitrarily assigned to one or the other. These two courses are not equivalent in their demands on the students, nor are their contents tailored to the needs of engineering students. Consequently, it has been suggested that the Geology department offer a new field course of appropriate content intended solely for students of the Mineral Engineering program.

It is proposed to remove GLG340H1F and GLG445H1F from the program, and to replace them with a new course

### **MIN4XXH1F**

#### **Geology Field Camp for Engineers**

III-AELMEBASC -/-/0.50

At Geology Field Camp, students will learn to incorporate geological observations into their engineering data sets. The course will focus on the recognition of rock types in the field, mapping of geological structures related to mineralization of potential economic importance, and field measurement techniques for obtaining rock engineering data. Students will learn how to make geological observations that are of critical importance to their success as mineral engineers, and to foster a sense of excitement and curiosity about the rocks that form the physical environment within which they will work as professionals. The course will be taught in the Sudbury region where there are several operating mines, numerous excellent field exposures of rocks related to the formation of the impact-related Sudbury structure, inexpensive accommodations, as well as unrelated older rock sequences typical of Archean greenstone belts where much of Canada's mineral exploration takes place. Students attend the two week Geology Field Camp prior to the start of Fourth Year Fall Session.

Prerequisite: GLG207H1, GLG345H1, MIN429H1

### Engineering Minors

The Department of Chemistry offers the course CHM446S, Organic Materials Chemistry, which is an allowable technical elective in the Engineering Science – Nanoengineering Option. It is proposed to make this an allowable technical elective for the Bioengineering Minor.

It is proposed to designate CHE488S, CIV488S, MIE488F, MSE488F and ECE488 as allowable electives for the Engineering Business Certificate.

Courses GGR252 – Marketing Geography, GGR221New Economic Spaces and GGR220 – Spatial Geography of Economic Activity are proposed to be allowable electives for the Engineering Business Certificates (all are CS electives).

### **Process:**

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

### **Programs:**

All programs are involved in these changes, and the impact on students in the various programs has been considered.

### **Proposal/Motion:**

For information.