



## MEMORANDUM

**To:** Executive Committee of Faculty Council (March 25, 2015)  
Faculty Council (April 17, 2015)

**From:** Dr. Graeme Norval  
Chair, Undergraduate Curriculum Committee

**Date:** March 16, 2015

**Re:** Major Curriculum Changes for the 2015-2016 Academic Year

## 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 Undergraduate Curriculum Committee is tasked with managing the curriculum change process for the Faculty. This report summarizes program course changes for the upcoming academic year.

## STRUCTURE

There are several final curriculum changes for the 2015-16 academic year. It is noted that these are very late changes, and the programs have been advised that curriculum changes need to be completed before the end of a calendar year to make the subsequent year's academic calendar prior to students making course selections. Students have completed their elective requests in the Course and Options Selection (COS).

The committee recommends:

### IBBME

- Changing the description of the new course *BME225 H1 S – Biostatistics for Engineers* as an incorrect description was submitted by the program. The learning outcomes for the course remain unchanged.

### Current course description:

Students will be introduced to statistical approaches to efficiently design and analyze bioengineering data sets. The course introduces fundamental statistical concepts related to design and analysis of populations (statistical distributions, the central limit theorem, linear functions of random variables and error propagation, ANOVA, multiple regressions). Applied topics will include screening designs, full factorial designs, blocking and replication, response surface methods, custom designs, sequential design strategies, non-normal responses and transformations. Students will learn to apply these statistical approaches to solve practical problems in bioengineering. In particular, students will be sensitized to the interactions of living systems with the physical measurements being made. They will also be expected to become proficient in the use of statistical software required to analyze data sets. Finally, students will be expected to gain enough knowledge about experimental design strategies to be able to critically analyze the current literature.

### Revised course description:

Students will use the application of statistical methods to design, develop, improve biomedical devices and bioprocesses or to demonstrate the efficacy of medical treatments. Topics that will be covered include statistical distributions, the central limit theorem, linear functions of random variables and error propagation, statistical inference, analysis of variance, empirical model building (multiple regression) and design of experiments (screening designs, blocking, fractional factorial designs), since these are the techniques that are the most commonly used by practicing engineers. Students will also be expected to become proficient in the use of statistical software to analyze experimental data.

### ENGINEERING SCIENCE

- Adding four laboratories to the course *BME395 H1 F – Biomedical Systems Engineering II – Cells and Tissues* to better balance the laboratory load and to provide a better balance for student learning of laboratory skills.
- Adding *ECE469 H1 S – Optical Communications and Networks* as an allowable elective for the Physics Option.

### FIRST YEAR OFFICE

- Creating a course, *APS1XX H1 S – Interdisciplinary Introduction to Sustainability*, to be a complementary studies elective available to students in the International Foundation Program (summer), with the goal of fostering an interdisciplinary culture that is inherent to sustainability practice. Students will be taught the basic concepts of sustainability and, more importantly, how to apply sustainability principles in their intended fields of study. To practice the application of sustainability concepts within human systems, students' main course projects will involve remodeling a problem, project, or situation of their choice to be more

sustainable. Upon completion of this course, students should be able to approach any system with a sustainability lens, innovate sustainability strategies, and articulate the value of sustainability.

### **PROGRAM(S)**

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

### **PROCESS AND CONSULTATION**

This proposal has been reviewed and approved by the Undergraduate Curriculum Committee, which is comprised of faculty representatives from each undergraduate program; undergraduate students; the Vice-Dean, Undergraduate Studies; the Chair of First Year; the Associate Dean, Cross-Disciplinary Programs; and the Registrar. The Committee meets regularly and reviews changes to the undergraduate curriculum.

### **RECOMMENDATION AND MOTION FOR FACULTY COUNCIL**

THAT the proposed curriculum changes for the 2015-2016 academic year set out in Report 3466 be approved.