

May 1, 2017

Subject: Important Notes and Curriculum Changes in the 2017-2018 Calendar

Dear Student,

Each May, all students enrolled in the Computer Engineering program are mailed a letter advising them of curriculum changes that have occurred since their entry into the program. This letter and letters from previous years can be viewed at the following website:

<http://www.concordia.ca/encs/students/sas/undergrad-program-info/course-sequences/computer-eng.html>

Students must meet the requirements of their program in the calendar for the year in which they graduate. This letter is to advise you of changes to your program that will appear in the 2017-2018 Calendar. These changes may affect your selection of courses. Should you have any questions regarding this issue, please do not hesitate to contact Student Academic Services at (514) 848-2424, extension 3055.

You can view the program requirements and course descriptions at the following website:

<http://www.concordia.ca/academics/undergraduate/calendar/current/sec71.html>

VERY IMPORTANT:

- 1. Students must have completed all 200-level courses required for their program before they can register for *any* 400-level course.**
- 2. All 200-level courses within the program taken after September 1, 2012 which are prerequisites for other courses must be completed with a C- or higher. A 200-level course in which a student has obtained a D+ or lower must be repeated before attempting a course for which it is a prerequisite.**
- 3. Any courses that you are required to repeat (due to conditional standing or readmission) must be completed with a grade of C- or higher prior to graduation. This requirement will not be waived.**
- 4. Students are required to graduate having met the substantial equivalent of the curriculum in force in the Winter Term prior to degree conferral.**
- 5. To graduate, students must (i) satisfy all program requirements, (ii) be in acceptable standing in their last annual assessment, and (iii) have a minimum final graduation GPA of 2.00. The academic standings of potential graduates who have attempted less than 12 credits since their last assessment are determined on the basis that these credits constitute an extension of the last assessment period.**
- 6. You must apply for graduation. The application form can be found at: <http://registrar.concordia.ca/convo/gradapp.html>. The deadlines to apply for graduation are: Spring Convocation January 15th, and Fall Convocation July 15th**

1. Changes to the Engineering Core

There are no changes to the Engineering Core.

2. Computer Engineering Core

There are no changes to the Computer Engineering Core.

3. Computer Engineering Options

I. Avionics and Embedded Systems Option:

- a) There are no changes to the Avionics and Embedded Systems option.

II. Biological and Biomedical Engineering (BME):

- a) The Biological and Biomedical Engineering has been added.
- b) Students choosing the BME option must complete:
 - i. **COEN 433 Biological Computing and Synthetic Biology 3.00**
 - ii. **ELEC 444 Medical Image Processing 3.00**
 - iii. A minimum of 17.50 option elective credits, where at least 9.00 credits chosen from the list below, with no more than two science courses (BIOL or PHYS). The remaining 8.5 credits may be taken from the Computer Engineering Electives list.
 - 1. **COEN 432 Applied Evolutionary and Learning Algorithms 3.00**
 - 2. **COEN 434 Microfluidic Devices for Synthetic Biology 3.00**
 - 3. **ELEC 442 Digital Signal Processing 3.50**
 - 4. **BIOL 261 Molecular and General Genetics 3.00**
 - 5. **BIOL 266 Cell Biology 3.00**
 - 6. **BIOL 367 Molecular Biology 3.00**
 - 7. **PHYS 260 Introductory Biophysics 3.00**
 - 8. **PHYS 443 Quantitative Human Systems Physiology 3.00**
 - 9. **PHYS 445 Principles of Medical Imaging 3.00**

III. Pervasive Computing Option:

- a) The Biological and Biomedical Engineering has been added.
- b) Students choosing the BME option must complete:
 - i. **COEN 320 Introduction to Real-Time Systems** 3.00
 - ii. **COEN 421 Embedded Systems Design** 4.00
 - iii. **COEN 424 Programming on the Cloud** 3.00
 - iv. **COEN 445 Communication Networks and Protocols** 3.50
 - v. At least 3 of the remaining 10.00 credits must be selected from the Pervasive Computing Option Electives list below; the rest may be chosen from the Computer Engineering Electives list.
 - 1. **COEN 422 Cyber-Physical Systems** 3.00
 - 2. **COEN 446 Internet of Things** 3.00
 - 3. **COEN 447 Software-Defined Networking** 3.00
 - 4. **ELEC 367 Introduction to Digital Communications** 3.50
 - 5. **ELEC 472 Advanced Telecommunication Networks** 3.50
 - 6. **SOEN 321 Information Systems Security** 3.00

c) General Stream:

- a) Students not selecting an option must follow the general stream
 - i. **COEN 320 Introduction to Real-Time Systems** 3.00
 - ii. **COEN 445 Communication Networks and Protocols** 3.50
 - iii. 17.00 credits of Technical Electives with at least 3.00 credits from the General Stream Electives list below. The remaining credits can be chosen from the Computer Electives list.
 - 1. **COEN 345 Software Testing and Validation** 3.50
 - 2. **COEN 413 Hardware Functional Verification** 3.00
 - 3. **SOEN 321 Information Systems Security** 3.00

IV. Computer Engineering Electives

Courses are listed in groups to facilitate course selection. With adequate academic justification and with permission of the Department, students may take one technical elective course from the Electrical Engineering Electives list.

A. Hardware/Electronics/VLSI Credits

- i) COEN 315 Digital Electronics 3.50
- ii) COEN 413 Hardware Functional Verification 3.00
- iii) COEN 451 VLSI Circuit Design 4.00
- iv) ELEC 312 Electronics II 3.50
- v) ELEC 423 Introduction to Analog VLSI 4.00
- vi) ELEC 458 Techniques in Electromagnetic Compatibility 3.00

B. Real-Time and Software Systems Credits

- i) COEN 320 Introduction to Real-Time Systems 3.00
- ii) COEN 345 Software Testing and Validation 3.50
- i) COEN 421 Embedded Systems Design 4.00
- ii) COEN 422 Cyber-Physical Systems 3.00
- iii) COEN 424 Programming on the Cloud 3.00
- iv) COEN 432 Applied Evolutionary and Learning Algorithms 3.00

C. Biological and Biomedical Engineering Credits

- i) COEN 432 Applied Evolutionary and Learning Algorithms 3.00
- ii) COEN 433 Biological Computing and Synthetic Biology 3.00
- iii) COEN 434 Microfluidic Devices for Synthetic Biology 3.00
- iv) ELEC 444 Medical Image Processing 3.00

D. Computer Science and Software Engineering Credits

- i) COMP 335 Introduction to Theoretical Computer Science 3.00
- ii) COMP 353 Databases 4.00
- iii) COMP 371 Computer Graphics 4.00
- iv) COMP 426 Multicore Programming 4.00
- v) COMP 428 Parallel Programming 4.00
- vi) COMP 442 Compiler Design 4.00
- vii) COMP 451 Database Design 4.00
- viii) COMP 465 Design and Analysis of Algorithms 3.00
- ix) COMP 472 Artificial Intelligence 4.00
- x) COMP 474 Intelligent Systems 4.00