

**COEN 7/8th Semester - 4th Year
Elective Course Selection Information**

Computer Engineering

**Department of Electrical & Computer Engineering
Ryerson University**

March 2017

COEN 7th Semester Electives

Core Courses: COE700, COE758 and COE768 as well as an Elective Course

List A

- **COE 718** Hardware-Software Codesign of Embedded Systems
- **ELE 734** Low Power Digital Integrated Circuits

List B

- **ELE 531** Electromagnetics
- **ELE 707** Sensors and Measurement
- **ELE 724** CMOS Mixed Mode Circuits and Systems
- **ELE 745** Digital Communication Systems
- **ELE 792** Digital Signal Processing
- **ELE 809** Digital Control System Design
- **ELE 829** System Identification
- **ELE 882** Introduction to Digital Image Processing

Select at-least one course from List A.

Select 2 courses from A and B Lists.

All required third year courses are pre-requisites.

COEN 8th Semester Electives

List A

- ELE 709: Real-time Computer Control System
- ELE 725: Basics of Multimedia Systems
- ELE 815: Wireless Communications (PReq: ELE 745)
- ELE 863: VLSI Circuits for Data Comm. (PReq: ELE724)
- ELE 885: Optical Communication Systems
- ELE 888: Intelligent Systems

List B

- COE 817: Network Security
- COE 818: Advanced Computer Architecture
- COE 838: System-on-Chip Design
- COE 848: Fundamentals of Data Engineering
- COE 865: Advanced Computer Networks
- CPS 883: Compilers
- CPS 888: Software Engineering

Select a minimum of 2 from List B, and a minimum of 1 course from List A. There are pre-requisites from 3rd year and some courses from 7th semester.

Important Points

- *Themes 1, 2, 3, 4 and 5 are strongly recommended for computer engineering students.*
- *Some 8th semester courses may have a 7th semester course as pre-requisite. Please refer to the course description section of the calendar.*
- *Some other 8th semester courses could also be substituted in order to provide you with a breadth of specialization.*
- *Courses that do not meet the enrolment target will be cancelled and you will be notified accordingly.*

Theme 1: Computer – VLSI Systems

For this theme the courses are mainly focused in the core areas of Computer Engineering such as advanced computer architecture, VLSI design, VLSI circuit testing, embedded system design, software systems and advance computer networks.

7th Semester

ELE734, (ELE724 or COE718)

8th Semester

COE838, ELE863 one course each out of (COE818, COE865) and (ELE725 and ELE888)

Theme 2: Software Systems

In this theme the courses will be mainly in the area of software engineering, programming languages and biomedical signal and image analysis. This theme will cover compilers and translators, software engineering and biomedical signal processing concepts .

7th Semester

COE718, (ELE882 or ELE792)

8th Semester

COE848, CPS888 and two courses out of (ELE725, COE865, COE838)

Theme 3: Embedded Computer Systems

Embedded computer systems deals with system-on-chip and μ computer systems that are embedded with industrial controllers, biomedical instruments, appliances and entertainment systems. Embedded systems are extensively employed in home, automotive, banking, military, aerospace and industrial control applications.

7th Semester

COE718, (ELE707 or ELE882 or ELE809)

8th Semester

COE838, ELE725 and two courses out of (COE818, COE865, ELE709)

Theme 4: Computer Communication and Networking

Computer communication and networking deals with the transfer of digital information (voice, data, image, and/or video) between two computer systems. The transfer of information could be performed by using wired or wireless communication links over the internet or LANs.

7th Semester

ELE745, COE718

8th Semester

COE865, COE 817, ELE815, and one out of (COE838, ELE725, ELE885)

Theme 5: Multimedia Systems

Multimedia Systems deal with the Advanced Signal and Image Processing Techniques. Multimedia System's area is related to -- Digital Image Processing, Signals & Systems courses -- listed here.

7th Semester

ELE882, COE718

8th Semester

ELE725, COE848, and two out of (COE838, CPS888, ELE888)

Theme 6: Digital Control Systems

Digital Control Systems are widely involved in day-to-day life. Control system is an area in which electrical, mechanical, or electromechanical system could be made to behave in a prescribed way over a period of time. Control systems play an important role in robotics, automotive and other dynamical/automatic systems.

7th Semester

COE718 and (ELE809 or ELE707)

8th Semester

COE 818, COE 838, ELE709 and (ELE888 or CPS888)

Important Points

- ***Themes 1, 2, 3, 4 and 5 are strongly recommended for computer engineering students.***
- ***Some 8th semester courses may have a 7th semester course as pre-requisite. Please refer to the course description section of the calendar.***
- ***Some other 8th semester courses could also be substituted in order to provide you with a breadth of specialization.***
- ***Courses that do not meet the enrolment target will be cancelled and you will be notified accordingly.***