

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

Computer Engineering

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

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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 703** Simulation and Computation Techniques
- **ELE 704** CMOS Integrated Analog Circuits
- **ELE 709** Real-time Computer Control Systems
- **ELE 745** Digital Communication Systems
- **ELE 772** Biomedical Signal Analysis
- **ELE 829** System Identification
- **ELE 531** Electromagnetics

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 604 Electronic Sensors and Measurement (old ELE744)
- ELE 632 Signals and Systems II (old ELE792)
- ELE 809 Digital Control System Design
- ELE 813 VLSI Circuit Testing (PR: ELE 704 or ELE 734)
- ELE 815 Cellular Mobile Communications (PR: ELE 745)
- ELE 863 VLSI Systems (PR: ELE 734 or ELE704)
- ELE 869 Robotics
- ELE 874 Biomedical Instrumentation (PR: ELE 772)
- ELE 882 Intro to Digital Image Processing
- ELE 885 Optical Communication Systems
- ELE 888 Intelligent Systems

List B

- COE 808 Programming Languages
- COE 818 Advanced Computer Architecture (PR: COE 758)
- COE 828 Digital System Design Automation
- COE 865 Advanced Computer Networks (PR: COE 768)
- CPS 883 Compilers
- CPS 888 Software Engineering

Select a minimum of 2 from List B, and 4 courses from the Lists A and B.

All required third year courses are pre-requisites plus some courses course from 7th semester.

Important Points

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

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, (COE718 or ELE704)

8th Semester

COE828, ELE813, ELE863, (COE818 or one course out of CPS888, COE865, CPS883)

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 concepts biomedical signal processing.

7th Semester

COE 718, (ELE772 or ELE703)

8th Semester

COE808, CPS888, and two courses out of (CPS883, COE865, COE828, ELE632, ELE882, ELE888)

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

COE 718, (ELE734 or ELE829)

8th Semester

ELE604, CPS888, COE818, and (one course out of COE865, ELE882, ELE809/ELE869, ELE888)

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

COE 718, ELE745

8th Semester

COE865, CPS883, ELE815 or ELE885 and one out of these course (COE818, COE828, CPS888)

Theme 5: 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, (ELE829 or ELE709)

8th Semester

COE818, COE865 and 2 courses out of (ELE604, ELE809, ELE869, ELE888).

Theme 6: Signal and Image Processing

Digital Signal and Image Processing area is related to Multimedia Systems. This theme will also allow students to take some course in Biomedical Signal Processing area.

7th Semester

COE718, ELE772

8th Semester

CPS888, COE808, or CPS883 and two courses out of (ELE632, ELE882, ELE874).