

This is a proposal for discussion. Not a set of decisions.

SUGGESTED SPECIALIZATION AREAS

- As guidelines for students in planning their program, we recommend the following specialization areas:
- Electrical Engineering
 - Communications
 - Electrical Energy Systems
 - Microsystems and Nanotechnology
 - Integrated Circuits and Systems-on-Chip
- Computer Engineering
 - Computing Systems
 - Integrated Circuits and Systems-on-Chip
 - Software Systems and Engineering
- *No record of these specializations within ECE will appear on the transcript or diploma but a **letter of completion** will be issued by the Department upon completion of the appropriate courses. There is marginal administrative overhead.*

The following lists are examples. We can adjust the course makeup based on departmental feedback.

Courses are pegged to terms so that students can plan their schedules and we can ensure that there are no timetabling conflicts.

COMMUNICATIONS

- Select at least four courses. Courses in bold are considered core to the area.
- Term 1
 - EECE 358: Computer Communications
 - **EECE 453: Communication Systems**
 - EECE 483: Antennas and Propagation
- Term 2:
 - EECE 452: Introduction to Optical Networks
 - **EECE 454: Digital Communication Systems**
 - EECE 455: Error-Control Coding for Communications and Computers
 - EECE 457: RF Integrated Circuits

ELECTRICAL ENERGY SYSTEMS

- Select at least four courses. Courses in bold are considered core to the area.
- Term 1
 - **EECE 458: Power Systems Analysis I**
 - **EECE 493: Power Electronics**
 - EECE 495: Industrial Drives
 - EECE 498: Optimization of Power Systems Operation
- Term 2:
 - **EECE 392: Distributed Energy Systems**
 - EECE 459: Power Systems Analysis II
 - EECE 497: Power Systems Protection
 - EECE 499: Decision Support Methods in Power Systems Operation

MICROSYSTEMS & NANOTECHNOLOGY

- Select at least four courses.
- Term 1
 - EECE 401: Nanotechnology in Electronics
 - EECE 402: Sensors and Actuators in Microsystems
 - EECE 432: Biological MEMS
 - EECE 489: Microsystems Design
- Term 2:
 - EECE 403: Micro/Nano Fabrication and Instrumentation Lab
 - EECE 404: Nanotechnology and Nature
 - EECE 405: Quantum Dots and Device Applications
 - EECE 480: Semiconductor Devices

INTEGRATED CIRCUITS & SYSTEMS-ON-CHIP

- Select at least four courses. Courses in bold are considered core to the area. This specialization area is common to Electrical & Computer Engineering.
- Term 1
 - EECE 402: Sensors and Actuators in Microsystems
 - EECE 476: Computer Architecture*
 - **EECE 479: Introduction to VLSI**
 - EECE 488: Analog CMOS IC Design*
 - EECE 489: Microsystems Design
- Term 2:
 - EECE 457: RF Integrated Circuits
 - EECE 465: Microcomputer Systems Design
 - EECE 480: Semiconductor Devices
 - **EECE 481: Digital IC Design**
- * Computer Engineering students should take EECE 476 and Electrical Engineering students should take EECE 488.

COMPUTING SYSTEMS

- Select at least five courses. Courses in bold are considered core to the area. Rules regarding electives selection and number of ECE courses must be followed.
- Term 1
 - **EECE 358: Computer Communications**
 - **EECE 476: Computer Architecture**
 - EECE 479: Introduction to VLSI
 - CPSC 415: Advanced Operating Systems
- Term 2:
 - **EECE 411: Design of Distributed Software Applications**
 - EECE 494: Real-Time Systems Design
 - CPSC 411: Introduction to Compiler Construction

SOFTWARE SYSTEMS & ENGINEERING

- Select at least five courses. Courses in bold are considered core to the area. Rules regarding electives selection and number of ECE courses must be followed.
- Term 1
 - **EECE 310: Software Engineering**
 - EECE 416: Verification of Software-Intensive Systems
 - EECE 417: Software Architecture
 - CPSC 304: Introduction to Relational Databases*
 - **CPSC 320: Intermediate Algorithm Design and Analysis***
 - CPSC 340: Machine Learning and Data Mining
 - CPSC 312: Functional and Logic Programming
 - CPSC 415: Advanced Operating Systems
- Term 2:
 - EECE 411: Design of Distributed Software Applications
 - EECE 412: Computer Security
 - EECE 418: Human Computer Interfaces in Engineering Design
 - EECE 443: Software Project Management
 - EECE 494: Real-Time Systems Design
 - CPSC 314: Computer Graphics*
 - CPSC 322: Introduction to Artificial Intelligence*
- * Typically offered both terms.