Suggested Concentration Courses

While it is not required, students have the opportunity to focus some of their elective courses in a particular sub-discipline of Electrical Engineering or Computer and Systems Engineering. The Restricted Electives, Technical Elective, Laboratory Elective (EE) and Computer Engineering Elective (CSE) can be used for this concentration in addition to Free Electives. The list below provides some guidance to courses a student may wish to take to develop a focus in a particular area.

Communications and Information Processing

- ECSE-4520 Communication Systems
- ECSE-4560 Digital Communications
- ECSE-4760 Real-Time Applications in Control and Communications (Lab Elective)
- ECSE-4530 Digital Signal Processing
- ECSE-4540 Introduction to Image Processing
- ECSE-4800 Subsurface Sensing and Imaging Systems
- MATH-4300 Introduction to Complex Variables: Theory and Applications
- MATH-4100 Linear Algebra

Computer Graphics & Applications

- ECSE-4750 Computer Graphics (Computer Engineering Elective)
- CSCI-4530 Advanced Computer Graphics
- CSCI-4520 Game Development
- CSCI-4380 Database Systems (Computer Engineering Elective)
- MATH-4300 Introduction to Complex Variables: Theory and Applications

Computer Hardware

- ECSE-4220 VLSI Design
- ECSE-4760 Computer Hardware Design
- ECSE-4770 Advanced Computer Hardware Design
- ECSE-4790 Microprocessor Systems (Lab Elective, Computer Engineering Elective)

Computer Networks

- ECSE-4670 Computer Communications Networks (Computer Engineering Elective)
- CSCI-4220 Network Programming
- CSCI-4650 Networking Laboratory I
- CSCI-4660 Networking Laboratory II
- CSCI-4670 Networking Security Laboratory

Computer Systems

- ECSE-4770 Computer Hardware Design (Lab Elective)
• ECSE-4790 Microprocessor Systems (Lab Elective, Computer Engineering Elective)
• CSCI -4050 Computability and Complexity
• CSCI -4210 Operating Systems
• CSCI -4220 Network Programming
• CSCI -4320 Parallel Programming
• MATH-4800/CSCI-4800 Numerical Computing
• MATH-4150/CSCI-4260 Graph Theory

Control and Robotics

• ECSE-4440 Control Systems Engineering
• ECSE-4510 Digital Control Systems
• ECSE-4760 Real-Time Applications in Control and Communications (Lab Elective)
• ECSE-4480 Robotics I
• ECSE-4490 Robotics II
• ECSE-4530 Digital Signal Processing
• MATH-4100 Linear Algebra

Electric Power and Energy

• ECSE-4080 Semiconductor Power Electronics
• ECSE-4110 Power Engineering Fundamentals
• ECSE-4120 Electromechanics
• ECSE-4130 EPE Laboratory (Lab Elective)
• ECSE-4180 Industrial Power System Design

Electronics

• ECSE-4040 Digital Electronics
• ECSE-4050 Advanced Electronics
• ECSE-4080 Semiconductor Power Electronics
• ECSE-4090 Mechatronics
• ECSE-4220 VLSI Design (Lab Elective)

Manufacturing

• ENGR-4710 Advanced Manufacturing Laboratory I (Lab Elective)
• ENGR-4720 Advanced Manufacturing Laboratory II
• ECSE-4440 Control Systems Engineering
• ECSE-4480 Robotics I
• ECSE-4490 Robotics II

Microelectronics, Optics and Electromagnetics

• ECSE-4220 VLSI Design (Lab Elective)
• ECSE-4250 Integrated Circuit Processes and Design
• ECSE-4630 Lasers and Optical Systems
• ECSE-4640 Optical Communications and Integrated Optics
• ECSE-4720 Solid State Physics
• ECSE-4160 Fields & Waves II
• ECSE-4320 Plasma Engineering
• MATH-4600 Advanced Calculus