ELECTRICAL AND COMPUTER ENGINEERING (ECE)

ECE 1001 - Introduction to Electrical and Computer Engineering I
Credit(s): 1 Credit
This course will cover the Cura Personalis I interwoven with topics from Electrical and Computer Engineering. The Electrical and Computer topics will be presented in a active learning setting with an emphasis on reinforcing the Cura Personalis I objectives.
Attributes: UUC:Self in Community

ECE 1002 - Introduction to Electrical and Computer Engineering II
Credit(s): 1 Credit
Continuation of the Intro to ECE I - Electrical Devices, magnetic devices, electronic devices, digital logic, computer organization, communication systems. Design concepts in electrical and computer engineering. Hands-on experience on familiar pieces of electronic gear. Introduction to software packages applicable to electrical engineering. Spring semester.

ECE 1100 - Electrical Engineering 101
Credit(s): 2 Credits
The study of Electrical Engineering concetps related to Energy, Power, Signal Theory, Sensors, Transducers and noise. This study will be conducted through experimental exploration of the fundamental concepts.

ECE 1200 - Computer Engineering 101
Credit(s): 2 Credits
The study of Computer Engineering concetps related to Digital Design Data Representation, Microprocessor Programming, Digital interfacing, and Analog Interfacing. This study will be conducted through experimental exploration of the fundamental concepts.

ECE 2001 - Introduction to Electrical Engineering
Credit(s): 3 Credits
Basic DC circuit analysis techniques including current, voltage and power concepts, mesh analysis, node analysis and circuit reduction techniques. Basic AC circuit analysis techniques including impedance concepts, phasor notation, power principles, principles of circuit frequency response and filter concepts. Transient analysis of simple inductive and capacitive networks. Principles of operational amplifier circuit analysis including basic active filter design. Introduction to transformers, power supplies and motors.
Prerequisite(s): (MATH 1520 or SLU Math Placement with a minimum score of 2530); PHYS 1630

ECE 2002 - Electrical Engineering Lab
Credit(s): 1 Credit
Laboratory experiments to emphasize materials covered in ECE 2001. Offered every semester.
Prerequisite(s): ECE 2001[*]

[*] Concurrent enrollment allowed.

ECE 2101 - Electrical Circuits I
Credit(s): 3 Credits
Physical foundations of electrical circuits. Ohms' Law, Kirchhoff's Laws, node and mesh analysis, Thevenin's/Norton's equivalents, and the principle of superposition. Transient analysis of simple RL, RC and RLC circuits. Operational amplifier circuits. Fall semester.
Prerequisite(s): (PHYS 1610 and MATH 1520)

ECE 2102 - Electrical Circuits II
Credit(s): 3 Credits
Sinusoidal steady-state analysis, sinusoidal steady-state power calculation, balanced 3-phase systems. Mutual inductance and transformers, series and parallel resonance. Applications of Laplace and Fourier transforms to circuit analysis. Spring semester.
Prerequisite(s): ECE 2101

ECE 2103 - Electrical Circuits Lab
Credit(s): 1 Credit
Laboratory experiments to emphasize materials covered in ECE 2101 and 2102. Spring semester.
Prerequisite(s): ECE 2101[*]

[*] Concurrent enrollment allowed.

ECE 2205 - Digital Design
Credit(s): 3 Credits
Number systems. Boolean algebra. Logical function. Combinational circuits. Flip-flops, registers and counters. Arithmetic, memories. Introduction to digital computers and microprocessors. Fall semester.
Corequisite(s): ECE 2206

ECE 2206 - Digital Design Lab
Credit(s): 1 Credit
Laboratory experiments to emphasize materials covered in ECE 2205. Fall semester.
Corequisite(s): ECE 2205

ECE 2910 - Co-op in Electrical and Computer Engineering
Credit(s): 0-3 Credits (Repeatable for credit)
An optional supervised work experience with an agency, firm or organization which employs engineers. Grading system is determined by department offering course. Every semester.
Restrictions:
Students with a classification of Freshman may **not** enroll.

Attributes: UUC:Reflection-in-Action

ECE 2915 - Internship with Industry
Credit(s): 1-3 Credits (Repeatable for credit)
A work experience with an agency, firm or organization that employs persons in this degree field. This experience may be full time or part-time as required by the industry sponsor. This course is used for the first experiential learning session. Grading system is determined by department offering course. Offered every semester.
Attributes: UUC:Reflection-in-Action

ECE 2930 - Special Topics
Credit(s): 1-3 Credits (Repeatable for credit)
Independent study on any electrical engineering topic under the direction of a faculty member.
Restrictions:
Students with a classification of Freshman may **not** enroll.

ECE 2980 - Independent Study
Credit(s): 1 or 3 Credits (Repeatable for credit)

ECE 3052 - Probability and Random Variables for Engineers
Credit(s): 3 Credits
The goal of this course is to introduce the principles and concepts of random experiments and illustrate the application of those to problems of an engineering nature. Topics covered include the axioms of probability, combinatorics, the random variable (RV), distribution functions, expectations and statistics, the gaussian RV, transformations, central limit theorem, confidence intervals, and hypothesis testing. Both discrete and continuous random variables will be covered. Computer programming may be used to reinforce coursework material. Offered in spring.
Prerequisite(s): MATH 2530; (BME 2000, CSCI 1060, or CSCI 1300)

ECE 3090 - Junior Design
Credit(s): 1 Credit
This is a breadth first course in system design and design group dynamics. This course is intended to prepare students for their capstone design sequence by introducing them to the design of multi-system open ended design problems. This introduction will be facilitated through several design problems. Students will work in design groups with similar objectives as are expected in the capstone design class.
Prerequisite(s): ECE 3150

ECE 3110 - Electric Energy Conversion
Credit(s): 3 Credits
Magnetic theory and circuits. Transformers. Electromechanical energy conversion. Induction motors. Direct current machines. Electromechanical components of control systems. Direct energy conversion methods. Fall semester.
Prerequisite(s): ECE 2102; MATH 3550

ECE 3130 - Semiconductor Devices
Credit(s): 3 Credits
An introduction to fundamentals of semiconductors and semiconductor devices. Electrical properties of solids, energy band diagrams, semiconductor theory. Introduction to workings of devices such as p-n junctions, bipolar junction transistors, field effect transistors (JFETs, MOSFETs, MODFETs). Fall semester.
Prerequisite(s): ECE 2102; MATH 3550

ECE 3131 - Electronic Circuit Design
Credit(s): 3 Credits
Review of semiconductor materials and their electronic properties and applications to electronic devices. Introduction to designing circuits using P-N junction (diodes), bipolar junction transistors (BJTs), and field effect transistors (FET). Introduction to design of Class A, B, and AB amplifiers. Analysis and design of single and multi-stage amplifiers using BJTs and FETs transistors. Spring semester.
Prerequisite(s): ECE 3130

ECE 3132 - Electronic Circuit Design Lab
Credit(s): 1 Credit
Laboratory experiments to emphasize materials covered in ECE 3131. Spring semester.
Prerequisite(s): ECE 3131[*]

[*] Concurrent enrollment allowed.

ECE 3140 - Electromagnetic Fields
Credit(s): 3 Credits
The electromagnetic model. Vector analysis. Static electric fields, static magnetic fields. Time-varying fields and Maxwell's equations. Plane electromagnetic waves. Spring semester.
Prerequisite(s): ECE 2102; MATH 3550

ECE 3150 - Linear Systems
Credit(s): 3 Credits
Introduction to signals and systems. Linear time-invariant systems. Fourier analysis of continuous-time signals and systems. Fourier analysis of discrete-time signals and systems. The Laplace transforms, Z-transforms. Fall Semester.
Prerequisite(s): (ECE 2001 or ECE 2102); MATH 3550

ECE 3150X - Signals
Credit(s): 3 Credits
Signal representations in the time domain and frequency domain, Fourier transforms, Laplace transforms, Z-transforms, linear systems, transfer functions, system response in time and frequency, analog and digital processing of signals. Relating signal properties to physical parameters.

ECE 3151 - Linear Systems Lab
Credit(s): 1 Credit
Laboratory experiments to emphasize materials covered in ECE 3150. Fall semester.
Prerequisite(s): (CSCI 1060, CSCI 1300, or BME 2000); ECE 3150[*]

[*] Concurrent enrollment allowed.

ECE 3205 - Advanced Digital Design
Credit(s): 3 Credits
Digital Design with Programmable Logic Devices (PLDs) and Field Programmable Gate Arrays (FPGAs); HDL design entry methods; Event driven simulation; Verification using simulation test benches; Timing verification using Back Annotated simulations.
Prerequisite(s): ECE 2205

ECE 3215 - Computer Systems Design
Credit(s): 3 Credits
Organization and design considerations of computer expansion peripherals. Analysis of expansion channel throughput and the influences that impact throughput including resource sharing and overhead. Special emphasis is placed on design concerns automating the movement of data into and out a modern PC.
Prerequisite(s): ECE 3205; ECE 3225

ECE 3216 - Computer Systems Design Lab
Credit(s): 1 Credit
Laboratory investigation of microcomputing expansion covering the material in ECE 315. Practical aspects of peripheral design and implementation. Design, construction, programming, simulation and testing of expansion hardware and the software required to interact with them. Use of hardware description languages and software development tools.
Corequisite(s): ECE 3215

ECE 3217 - Computer Architecture and Organization
Credit(s): 3 Credits
Introduction to the organization and architecture of computer systems, including aspects of digital logic, data representation, assembly level organization, memory systems, and processor architectures. Spring semester.
Prerequisite(s): (CSCI 1300 and MATH 1660)

ECE 3225 - Microprocessors
Credit(s): 3 Credits
Review of number systems. Microprocessors/microcomputer structure, input/output. Signals and devices. Computer arithmetic, programming, interfacing and data acquisition. Fall semester.
Prerequisite(s): (CSCI 1060, BME 2000, or CSCI 1300)

ECE 3226 - Microprocessors Laboratory
Credit(s): 1 Credit
Concurrent registration with ECE 3225. Laboratory experiments to emphasize materials covered in ECE 3225. Fall semester.
Prerequisite(s): ECE 3225*

* Concurrent enrollment allowed.

ECE 3910 - Co-op with Industry
Credit(s): 0-3 Credits (Repeatable for credit)
A full-time supervised work experience with an agency, firm or organization that employs persons in this degree field. Grading system is determined by department offering course. Offered every semester.
Restrictions:
Enrollment limited to students with a classification of Junior or Senior.

Attributes: UUC:Reflection-in-Action

ECE 3915 - Internship with Industry
Credit(s): 1-3 Credits (Repeatable for credit)
A work experience with an agency, firm or organization that employs persons in this degree field. This experience may be full time or part-time as required by the industry sponsor. Grading system is determined by department offering course. Offered every semester.
Restrictions:
Enrollment limited to students with a classification of Junior or Senior.

Attributes: UUC:Reflection-in-Action

ECE 3930 - Special Topics
Credit(s): 1-3 Credits (Repeatable for credit)
Independent study on any electrical engineering topic under the direction of a faculty member.
Restrictions:
Enrollment limited to students with a classification of Junior or Senior.

ECE 3980 - Independent Study
Credit(s): 1 or 3 Credits (Repeatable for credit)

ECE 4110 - Power Systems Analysis I
Credit(s): 3 Credits
The course deals with analysis and design of electrical power transmission lines and its components. Per-Unit and power systems: Transformers and power lines. RLC - Computing transmission line parameters, ABCD parameters and transmission line steady-state operation. Power flows and system protection.

ECE 4120 - Automatic Control Systems
Credit(s): 3 Credits
Linear time-invariant systems. Transfer functions, block diagrams and signal flow graphs. Stability, time and frequency response, and root locus analysis. Compensator design in time and frequency domain. Spring semester.
Prerequisite(s): ECE 3150

ECE 4132 - Analog Integrated Circuit Design
Credit(s): 3 Credits
The purpose of the course is to build on introductory level analog electronics design. It will cover such topics as active loads and current mirrors and then proceed to output stages of amplifiers utilizing Class A, Class B, and Class AB amplifiers. We will employ both Bipolar and MOS technologies. Multistage amplifiers will be introduced. Design of Operational Amplifiers and Differential amplifiers will be covered. Frequency response of amplifiers and stability of feedback circuit will also be covered.

ECE 4140 - Electromagnetic Waves
Credit(s): 3 Credits
Introduction, elementary transmission line concepts. Standing-wave AC configurations. Smith chart and matching problems. Plane waves and wave impedance. Mode theory of rectangular waveguides. Microstrips, stripline and other practical transmission lines. Fall semester.
Prerequisite(s): ECE 3140

ECE 4141 - Radar Systems
Credit(s): 3 Credits
Nature of radar, basic elements of the radar systems. Radar waveforms and applications. Tracking radar techniques and applications, radar electronic counter countermeasures (ECCM).
Prerequisite(s): ECE 4160

ECE 4150 - Filter Design
Credit(s): 3 Credits
Transfer functions. Op-amp RC circuits. Design of Butterworth, Chebyshev, elliptic and delay filters. Frequency transformation and switched capacitor filters. On demand.
Prerequisite(s): ECE 3131; MATH 3550

ECE 4151 - Digital Signal Processing
Credit(s): 3 Credits
Filtering, convolution, and Fourier transform of digital signals. Analysis, design and implementation of FIR and IIR filters. Quantization, round-off and scaling effects. DFT and circular convolution. FFT algorithms and implementation. On demand.
Prerequisite(s): ECE 3150; MATH 3550

ECE 4153 - Image Processing
Credit(s): 3 Credits
Introduction to digital images and image capture. Image transforms: DFT, FFT, Walsh, Hadamard, DCT, Hough and Hotelling transforms. Image enhancement, image restoration, image encoding and image segmentation. On demand.
Prerequisite(s): ECE 3150

ECE 4160 - Communication Systems
Credit(s): 3 Credits
Review of signal analysis and probability theory. Amplitude modulation systems. Frequency and phase modulation systems. Pulse modulation systems. Noise in CW modulation. Spring semester.
Prerequisite(s): ECE 3150; ECE 3052*

* Concurrent enrollment allowed.

ECE 4161 - Satellite Communication
Credit(s): 3 Credits
Overview of satellite systems. Orbits and launching methods. The space segment and the earth segment. Baseband signals and modulation, the space link. Satellite access: single access, pre-assigned FDMA, demand-assigned FDMA, spade system, TDMA, CDMA.

ECE 4162 - Cellular Communications
Credit(s): 3 Credits
This course covers the basic elements of Cellular communications include propagation phenomenology, multipath, frequency reuse and fading. Included are important aspects of cellular system performance including Grade-of-Service, cellular coverage, and cellular capacity. The course also covers select topics in current cellular system standards including digital modulation and error correction coding schemes.

ECE 4170 - Energy Technologies I
Credit(s): 3 Credits
The course is to introduce current energy consumption of the United States and the World. It is to review/study various energy sources and energy consumption portfolio of the United States and major industrial nations. It is then to consider the impact of various alternative renewable energy sources and energy conservation methods on overall energy consumption equation. In this course several major renewable energy sources such as wind, solar, geothermal as well as energy conservation methods will be studied.
Prerequisite(s): ECE 3110
Restrictions:
Enrollment is limited to students with a program in Electrical Engineering.

ECE 4225 - Hardware/Software Co-Design
Credit(s): 3 Credits
This course provides an understanding of hardware and software co-design. Topics include type of processors (software), types of integrated circuits (hardware), types of memory and memory architectures, interfacing and system design for real-time operation. This course will emphasis design space exploration and have a capstone project requiring the integration of real-time system into communicating hardware and software pieces.

ECE 4226 - Mobile Robotics
Credit(s): 3 Credits
This course is an introduction to robot kinematics, sensor technology and basic machine control. This course will develop the low level tools required to move robots in an environment and an appreciation of the requirements for doing so in an autonomous fashion. This course will have a capstone project requiring the design or development of a robot platform to meet a goal drawn from current topics.
Prerequisite(s): (ECE 3150 or ESCI 3110); (MATH 3850 or ECE 3052); (CSCI 1060, CSCI 1300, or BME 2000)

ECE 4235 - Digital IC Design
Credit(s): 3 Credits
Introduction to digital electronics. Metal-oxide semiconductor transistors, (MOST's), MOS inverters and gate circuits. Design of MOSFET based combinational and sequential circuits. Issues related to design of modern Digital Integrated Circuits is covered. Fall semester.
Prerequisite(s): ECE 2205; ECE 3131

ECE 4245 - Computer Networks Design
Credit(s): 3 Credits
Introduction to modern computer communication networks. Topics include point to point communication links and transmission of digital information; packet switching; multiplexing and concentrator design; multi-access and broadcasting; Local Area Networks; Wide Area Networks; ATM Networks; and ISDN; architectures and protocols for computer networks; the concept of OSI reference mode; discussion of the OSI seven layers; physical interfaces and protocols; dat link control layer; network layer; design issues and modeling techniques; case studies.
Prerequisite(s): CSCI 3500

ECE 4245X - Computer Networks
Credit(s): 3 Credits
An exploration of the underlying concepts and principles of computer networks. Topics include communication protocols such as TCP/IP, design of network architectures, and the management and security of networks. Examples of real networks will be used to reinforce and demonstrate concepts.

ECE 4800 - Electrical and Computer Engineering Design I
Credit(s): 3 Credits
Principles of engineering experimentation and design. Development of engineering design proposal. Fall Semester.
Prerequisite(s): Minimum Earned Credits of 90
Restrictions:
Enrollment is limited to students with a major in Computer Engineering or Electrical Engineering.

ECE 4810 - Electrical and Computer Engineering Design II
Credit(s): 3 Credits
Development, analysis and completion of detailed design in electrical engineering. Completion of a project under faculty supervision. Project results are presented in a formal report. Spring semester.
Prerequisite(s): ECE 4800

ECE 4910 - Co-Op with Industry
Credit(s): 1-3 Credits (Repeatable for credit)
A full-time supervised work experience with an agency, firm or organization that employs persons in this degree field. Grading system is determined by department offering course. Offered every semester.
Restrictions:
Enrollment limited to students with a classification of Senior.

Attributes: UUC:Reflection-in-Action

ECE 4915 - Internship with Industry
Credit(s): 1-3 Credits (Repeatable for credit)
A work experience with an agency, firm or organization that employs persons in this degree field. This experience may be full time or part-time as required by the industry sponsor. Grading system is determined by department offering course. Offered every semester.
Restrictions:
Enrollment limited to students with a classification of Senior.

Attributes: UUC:Reflection-in-Action

ECE 4930 - Special Lecture
Credit(s): 1-3 Credits (Repeatable for credit)
Selected topics of special interest to electrical engineering majors.
Restrictions:
Enrollment limited to students with a classification of Senior.

Enrollment is limited to students with a major in Computer Engineering or Electrical Engineering.

ECE 4931 - Special Lecture
Credit(s): 3 Credits (Repeatable for credit)
Selected topics of special interest to electrical engineering majors.
Restrictions:
Enrollment limited to students with a classification of Senior.

Enrollment is limited to students with a major in Computer Engineering or Electrical Engineering.

ECE 4980 - Independent Study
Credit(s): 1-3 Credits (Repeatable for credit)
Credit to be arranged. Independent study on an electrical & computer engineering topic under the direction of a faculty member.
Restrictions:
Enrollment limited to students with a classification of Senior.

Enrollment is limited to students with a major in Electrical Engineering.

ECE 5000 - Seminars
Credit(s): 0 Credits
Presentations of current research by students, faculty, and guests. Registration required in the first semester. Seminar attendance expected in subsequent semesters.

ECE 5055 - Stochastic Processes
Credit(s): 3 Credits
Introduction to probability theory, stochastic processes, statistical inference, and probabilistic models used in science, engineering, economics, and related fields. The course covers the fundamentals of probability theory (probabilistic models, discrete and continuous random variables, multiple random variables, and limit theorems), which are typically part of a first course on the subject. It also contains, a number of more advanced topics, from which an instructor can choose to match the goals of students. These topics include transforms, sums of random variables, a fairly detailed introduction to Bernoulli, Poisson, and Markov processes, Bayesian inference, and an introduction to classical statistics.

ECE 5110 - Power Systems Analysis I
Credit(s): 3 Credits
The course deals with analysis and design of electrical power transmission lines and its components. Per-Unit and power systems: Transformers and power lines. RLC - Computing transmission line parameters, ABCD parameters and transmission line steady-state operation. Power flows and system protection.

ECE 5120 - Modern Control Theory
Credit(s): 3 Credits
State-space representation (discrete and continuous) of linear systems. Observability and controllability. Controller design, estimator design and stability concepts. Digital control: continuous and discrete design. Hardware characteristics - A/D, D/A, prefilters. Quantization and sampling effects in digital control. On demand.

ECE 5132 - Analog Integrated Circuit Design
Credit(s): 3 Credits
The purpose of the course is to build on introductory level analog electronics design. It will cover such topics as active loads and current mirrors and then proceed to output stages of amplifiers utilizing Class A, Class B, and Class AB amplifiers. We will employ both Bipolar and MOS technologies. Multistage amplifiers will be introduced. Design of Operational Amplifiers and Differential amplifiers will be covered. Frequency response of amplifiers and stability of feedback circuit will also be covered.

ECE 5141 - Radar System
Credit(s): 3 Credits
Basic radar definitions; transmitter power, antenna coverage and gain; target cross-section, receiver noise and system losses; radar equations' pulsed radars; reflection of radar waves and weather conditions; synthetic array radars and pulse compression techniques; track-while scan and electronic scan; millimeter wave and laser radar systems.

ECE 5150 - Filter Design
Credit(s): 3 Credits
Frequency transformations, high-pass and low-pass band elimination filters, sensitivity. Passive ladder, ladder design with simulated elements, leap frog simulation of ladders. Switched-capacitor filters, delay filters, delay equalization. The Z-transform, IIR and FIR digital filters.
Prerequisite(s): ECE 402

ECE 5151 - Digital Signal Processing
Credit(s): 3 Credits
This course includes IIR and FIR discrete-time filter theory, mapping from continuous-time to discrete-time filters, bilinear-Z transform, Impulse Invariance method, implementation structures such as Direct form I & II, and numerical precision effects.

ECE 5153 - Image Processing
Credit(s): 3 Credits
Introduction to digital images and image capture. Image transforms: DFT, FFT, Walsh, Hadamard, DCT, Hough and Hotelling transforms. Image enhancement, image restoration, image encoding and image segmentation. On demand.

ECE 5160 - Communication Systems
Credit(s): 3 Credits
Review of signal analysis and probability theory. Amplitude modulation systems. Frequency and phase modulation systems. Pulse modulation systems. Noise in CW modulation. Additional topics at graduate level. Spring semester.
Prerequisite(s): ECE 3150; ECE 3052[*]

[*] Concurrent enrollment allowed.

ECE 5161 - Satellite Communications
Credit(s): 3 Credits
Overview of satellite systems; orbits and launching methods; the geostationary orbit; radio wave propagations; the space segment; the earth segment; the space link; interference; satellite access; satellite services and the internet.

ECE 5162 - Cellular Communications
Credit(s): 3 Credits
This course covers the basic elements of Cellular communications include propagation phenomenology, multipath, frequency reuse and fading. Included are important aspects of cellular system performance including Grade-of-Service, cellular coverage, and cellular capacity. The course also covers select topics in current cellular system standards including digital modulation and error correction coding schemes.

ECE 5170 - Energy Technologies I
Credit(s): 3 Credits (Repeatable for credit)
The course is to introduce current energy consumption of the United States and the World. It is to review/study various energy sources and energy consumption portfolio of the United States and major industrial nations. It is then to consider the impact of various alternative renewable energy sources and energy conservation methods on overall energy consumption equation. In this course several major renewable energy sources such as wind, solar, geothermal as well as energy conservation methods will be studied.
Prerequisite(s): ECE 3110

ECE 5225 - Hardware Software Co-Design
Credit(s): 3 Credits
This course provides an understanding of hardware and software co-design. Topics include type of processors (software), types of integrated circuits (hardware), types of memory and memory architectures, interfacing and system design for real-time operation. This course will emphasize design space exploration and have a capstone project requiring the integration of a real-time system into communicating hardware and software pieces.

ECE 5226 - Mobile Robotics
Credit(s): 3 Credits
This course is an introduction to robot kinematics, sensor technology and basic machine control. This course will develop the low level tools required to move robots in an environment and an appreciation of the requirements for doing so in an autonomous fashion. This course will have a capstone project requiring the design or development of a robot platform to meet a goal drawn from current topics.

ECE 5235 - Digital IC Design
Credit(s): 3 Credits
The course covers the whole range of basic issues related to digital integrated circuit design and development. The course will be mostly based on CMOS technology. It will cover some of the timing issues. Students are expected to carry out term project.
Prerequisite(s): ECE 3130

ECE 5245 - Computer Networks Design
Credit(s): 3 Credits
Introduction to modern computer communication networks. Topics include point to point communication links and transmission of digital information; packet switching; multiplexing and concentrator design; multi-access and broadcasting; Local Area Networks; Wide Area Networks; ATM Networks; and ISDN; architectures and protocols for computer networks; the concept of OSI reference mode; discussion of the OSI seven layers; physical interfaces and protocols; dat link control layer; network layer; design issues and modeling techniques; case studies. (Offered in Spring)
Prerequisite(s): CSCI 3500

ECE 5800 - ECE Design I
Credit(s): 3 Credits
Principles of engineering experimentation and design. Development of engineering design proposal.
Prerequisite(s): Minimum Earned Credits of 90

ECE 5810 - ECE Design II
Credit(s): 3 Credits
Development, analysis and completion of detailed design in electrical engineering. Completion of a project under faculty supervision. Project results are presented in a formal report and Senior Design Conference – poster session. (Offered in Spring)
Prerequisite(s): ECE 5800 with a grade of C or higher

ECE 5910 - Co-Op with Industry
Credit(s): 1-6 Credits
A full-time supervised work experience with an agency, firm or organization that employs persons in this degree field. Grading system is determined by department offering course. Offered every semester. 0-3 credit hours.

ECE 5915 - Internship with Industry
Credit(s): 1-3 Credits
A work experience with an agency, firm or organization that employs persons in this degree field. This experience may be full time or part time as required by the industry sponsor. Grading system is determined by department offering course. Offered every semester. 0-3 credit hours.

ECE 5930 - Special Topics
Credit(s): 3 Credits (Repeatable for credit)
Special topics course is based on faculty and students interests. This would be an avenue to develop new courses on a trial basis.

ECE 5960 - Masters Project
Credit(s): 1-3 Credits (Repeatable up to 12 credits)
Theoretical/ computational/ experimental work that leads to a project Report and defense of the Project.

ECE 5970 - Research Topics
Credit(s): 1-3 Credits (Repeatable up to 12 credits)
Theoretical or experimental work that is not part of the Thesis or Project.

ECE 5980 - Independent Study
Credit(s): 1-3 Credits (Repeatable up to 12 credits)
An individualized study course, in which students explore topics related to their graduate work and career goals. Students work with faculty members on a specific topic compatible to master's level and produces a report.

ECE 5990 - Masters Thesis Research
Credit(s): 0-6 Credits (Repeatable for credit)

ECE 6910 - Co-Op with Industry
Credit(s): 1-6 Credits
A full-time supervised work experience with an agency, firm or organization that employs persons in this degree field. Grading system is determined by department offering course. Offered every semester. 0-3 credit hours.

ECE 6915 - Internship with Industry
Credit(s): 1-3 Credits
A work experience with an agency, firm or organization that employs persons in this degree field. This experience may be full time or part time as required by the industry sponsor. Grading system is determined by department offering course. Offered every semester. 0-3 credit hours.

ECE 6930 - Special Topics
Credit(s): 3 Credits (Repeatable for credit)

ECE 6970 - Research Topics
Credit(s): 1-3 Credits (Repeatable up to 12 credits)
Theoretical or experimental work that is not part of the Dissertation.

ECE 6980 - Independent Study
Credit(s): 1-3 Credits (Repeatable for credit)
An individualized study course, in which students explore topics related to their graduate work and career goals. Students work with faculty members on a specific topic compatible to master's level and produces a report.

ECE 6990 - Doctoral Dissertation Research
Credit(s): 0-9 Credits (Repeatable for credit)