4340. Classroom and Behavioral Management Strategies for Exceptional Learners. 3 hours. Approaches to behavioral management of exceptional learners across a variety of educational settings. Implementation of individualized techniques including applied behavioral analysis, as well as larger-group strategies, to foster positive behavioral, social and emotional growth. Special attention to the development of behavioral intervention plans and positive behavioral supports for students with challenging behaviors. Prerequisite(s): EDSP 3210 or equivalent and EDSP 3240.

4350. Strategies to Support Diverse Learners in General Education. 3 hours. Examination of the roles of various professionals in the successful inclusion of students with disabilities in the general education classroom. Focus on consultation models, practices and principles with an emphasis on collaboration, cooperative learning and inclusion. Provides and overview of assessment techniques applicable for all learners in the general education classroom. Prerequisite(s): EDSP 3210, or equivalent.

4360. Transition Education and Services for Exceptional Learners. 3 hours. Transition education and services for individuals with disabilities across the life span with emphasis on the post-secondary years. Examines the theory and practice of transition planning from school to community living, post-secondary education and employment. Legislative history and practical applications of skills such as transition assessment, job development and job placement are emphasized. Prerequisite(s): EDSP 3210, 3240 and 4320.

4900-4910. Special Problems. 1–3 hours each.

4951. Honors College Capstone Thesis. 3 hours. Major research project prepared by the student under the supervision of a faculty member and presented in standard thesis format. An oral defense is required of each student for successful completion of the thesis. Prerequisite(s): completion of at least 6 hours in honors courses; completion of at least 12 hours in the major department in which the thesis is prepared; approval of the department chair and the dean of the school or college in which the thesis is prepared; approval of the dean of the Honors College. May be substituted for HNRS 4000.

Electrical Engineering

Electrical Engineering, EENG

1910. Project I (Learning to Learn). 2 hours. Learning to Learn (L2L) is based on sound cognitive and pedagogical techniques that improve learning outcomes and make lifelong learning habitual. Students develop an understanding of how engineering and computer science are learned and how we can facilitate and encourage the lifelong learning process. Topics covered include consciousness and self-awareness, metacognition, learning styles, memory, language, reading, writing, problem solving, creativity and biology of learning.

1920. Project II (Engineering Ethics and Professionalism). 2 hours. Engineering is the place where science, business and society intersect, so engineering ethics provides an interesting way to study the relationships among these three. This project course focuses on the profession of engineering, its role in business and society, and the ethical issues that engineers face. Class involves case studies, discussions, group projects, reading, writing response papers and exams; topics include international concerns, risk safety, and environmental issues, employee loyalties and professional responsibility, professional organizations and codes of conduct.

2610. Circuit Analysis. 3 hours. Introduction to electrical elements, sources and interconnects. Ohm's law, Kirchoff's law, superposition and Thevenin's theorems are introduced. The resistive circuit, OP Amp, RL, RC circuits, Sinusoidal analysis. Prerequisite(s): MATH 1720 and PHYS 2220/2240.

2620. Signals and Systems. 3 hours. Elementary concepts of continuous-time and discrete-time signals and systems. Linear time-invariant (LTI) systems, impulse response, convolution, Fourier series, Fourier transforms and frequency-domain analysis of LTI systems. Laplace transforms, z-transforms and rational function descriptions of LTI systems. Prerequisite(s): EENG 2610; MATH 3310 or MATH 2730. (Same as CSCE 3010.)

2710. Digital Logic Design. 3 hours. Digital computers and digital information processing systems; Boolean algebra, principles and methodology of logic design; machine language programming; register transfer logic; microprocessor hardware, software and interfacing; fundamentals of circuits and systems; computer organization and control; memory systems, arithmetic unit design. Prerequisite(s): MATH 1720

2910. Project III (Circuit Design and Analysis Using SPICE). 3 hours. Students are required to use PSPICE to design and analyze basic DC/AC circuits. Prerequisite(s): MATH 1720; EENG 2610 (may be taken concurrently) and MATH 3310 (may be taken concurrently).

2920. Project IV (CAD Tools and Design). 3 hours. Selected design experiments examining programmable logic, VHDL and logic synthesis. Includes a final comprehensive design to accompany and complement the logic design course. Prerequisite(s): EENG 2710 (may be taken concurrently).

3410. Engineering Electromagnetics. 3 hours. Electromagnetic theory as applied to electrical engineering: vector calculus; electrostatics and magnetostatics; Maxwell's equations, including Poynting's theorem and boundary conditions; uniform plane-wave propagation; transmission lines – TEM modes, including treatment of general, lossless line, and pulse propagation; introduction to guided waves; introduction to radiation and scattering concepts. Prerequisite(s): EENG 2610 and PHYS 2220.

3510. Electronics I (Devices and Materials). 3 hours. Introduction to contemporary electronic devices, terminal characteristics of active semiconductor devices, and models of the BJT and MOSFET in cutoff and saturation region are introduced. Incremental and DC models of junction diodes, bipolar transistors (BJTs), and metal-oxide semiconductor field effect transistors (MOSFETs) are studied to design single and multistage amplifiers. Prerequisite(s): EENG 2610.

3520. Electronics II. 3 hours. Concepts, analysis and design of electronic circuits and systems are introduced. Topics include principle of DC biasing, small signal analysis, frequency response, feedback amplifiers, active filters, non-linear op-amp applications and oscillators. Prerequisite(s): EENG 3510.

3710. Computer Organization. 3 hours. Principles of computer system organization, instruction sets, computer arithmetic, data and control paths, memory hierarchies. Prerequisite(s): CSCE 1030 and EENG 2710. (Same as CSCE 2610.)

3810. Communications Systems. 3 hours. Introduction to the concepts of transmission of information via communication channels. Amplitude and angle modulation for the transmission of continuous-time signals. Analog-to-digital conversion and pulse code modulation. Transmission of digital data. Introduction to random signals and noise and their effects on communication. Optimum detection systems in the presence of noise. Prerequisite(s): EENG 2620 and MATH 1780 or equivalent. (Same as CSCE 3020.)

3910. Project V (Digital Signal Processing Theory and Design). 3 hours. Basic theory and applications of modern signal processing. Topics include filter z-transform, filter design, Fast Fourier Transform (FFT) and applications of signal processing algorithms. Students are required to design a signal processing project using MATLAB or CADENCE software. Prerequisite(s): EENG 2620.

3920. Project VI (Electronic and Analog Design). 3 hours. Designing an analog system (such as Op-Amp) consisting of electronic devices such as MOS transistors, capacitors and resistors. Simulation tools are SPICE software. Prerequisite(s): EENG 3510. Corequisite(s); EENG 3520.

4010. Advanced Topics in Electrical Engineering I. 3 hours. Materials taught in the advanced topic I are decided by the instructor each term/semester, reflecting the state-of-the-art technology progress in electrical engineering. Prerequisite(s): to be decided by the instructor.

4020. Advanced Topics in Electrical Engineering II. 3 hours. Materials taught in the advanced topic II are decided by the instructor each term/semester, reflecting the state-of-the-art technology progress in electrical engineering. Prerequisite(s): to be decided by the instructor.

4710. VLSI Design. 3 hours. Basic knowledge of various aspects of modern VLSI design. They include MOS transistors, circuit design and analysis at transistor level, logic and digital sub-system and analysis, VLSI architecture, hardware description languages (VHDL, Verilog-HDL), VLSI testing and VLSI physical design (layout, floor planning, placement and routing), design examples using CAD tools and design projects. Prerequisite(s): EENG 2710 or equivalent. (Same as CSCE 4730.)

4810. Computer Networks. 3 hours. Introduction to data communication; asynchronous, synchronous, networks, TCP/IP and current technology. Prerequisite(s): EENG 2710, EENG 3810 and MATH 1780.

4910. Project VII (Communication System Design). 3 hours. Designing wireless communication system based on CADENCE software. This project aims to solve a practical engineering problem. Prerequisite(s): EENG 3810.

4951. Honors College Capstone Thesis. 3 hours. Major research project prepared by the student under the supervision of a faculty member and presented in standard thesis format. An oral defense is required of each student for successful completion of the thesis. Prerequisite(s): completion of at least 6 hours in honors courses; completion of at least 12 hours in the major department in which the thesis is prepared; approval of the department chair and the dean of the school or college in which the thesis is prepared; approval of the dean of the Honors College. May be substituted for HNRS 4000.

4990. Project VIII (Capstone Senior Design). 3 hours. The capstone senior design course is a comprehensive electrical engineering design course. Students may choose a design topic in VLSI, communications, Signal Processing or any other relevant electrical engineering area. Substantial design work is required for passing this course. Prerequisite(s): students may register only after all other required courses have been taken and passed.

Electronics Engineering Technology

see Engineering Technology

Elementary Education

see Teacher Education and Administration

Emergency Administration and Planning

see Public Administration

Engineering Technology

Construction Engineering Technology, CNET

1160. Construction Methods and Materials. 3 hours. (1;3) Introduction to the materials, systems, methods and procedures of building construction.

2180. Construction Methods and Surveying. 4 hours. (3;3) Contemporary methods and materials used in the construction industry; nature, use and characteristics of materials; construction methodology, application and sequencing in the building process. Surveying principles, instruments, measurements and calculations fundamentals of surveying for building construction; survey drawings and mapping. Prerequisite(s): CNET 1160.

2300. Architectural Drawing. 2 hours. (1;3) Emphasizes architectural details; home planning. Prerequisite(s): CNET 1160.

2900. Special Problems. 1–4 hours. Individualized instruction in theoretical or experimental problems. Prerequisite(s): consent of instructor.

3150. Construction Contract Documents. 2 hours. Interpretation of construction drawings; architectural, structural, mechanical, electrical and landscaping documents; development, interpretation and implementation of specifications and other construction documents. Prerequisite(s): CNET 2180.

3160. Construction Cost Estimating. 3 hours. Procedures, techniques and systems of construction cost estimating. Includes work classification, quantity detailing, specification interpretation and bid preparation. Prerequisite(s): CNET 1160 and 2300.

3190. Construction Scheduling. 3 hours. Study of construction scheduling utilizing current techniques including Critical Path Method (CPM), the Precedence Method (PM), the Program Evaluation and Review Technique (PERT) and a probabilistic method. Prerequisite(s): CNET 3160.