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

EDSP 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

EENG 1910. Project I: Learning to Learn. 3 hours. (2;2) 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 is learned and how they can facilitate and develop the lifelong learning process, both individually and in teams. Topics covered include consciousness and self-awareness, knowledge representation, cognition, learning styles, memory, language, reading, effective verbal and written communication, project-based learning, critical thinking, problem solving and creativity, design process, globalization and contemporary issues, professionalism, and ethics. Prerequisite(s): electrical engineering major or pre-major status.

EENG 1920. Project II: Introduction to Electrical Engineering. 2 hours. Provides students the foundation necessary for the successful execution of electrical engineering design projects. The design process embodies the steps required to take an idea from concept to successful design. These steps include the requirements specification, architectural model, concept generation and evaluation, feasibility study, functional decomposition, design, testing, an overview of ethical and legal issues, and maintenance. Technical design tools such as MATLAB, VHDL and Spice software, critical to designing a project, are introduced. Small projects using these design tools are implemented. A final project requires team work, an oral presentation and a written project report. Prerequisite(s): MATH 1710 and EENG 1910.

EENG 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. Corequisite(s): PHYS 2220/2240.

EENG 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; and MATH 3310 or MATH 2730. (Same as CSCE 3010.)

EENG 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 1710.

EENG 2900. Special Problems. 1–3 hours. Individualized instruction in theoretical or experimental problems in electrical engineering. For elective credit only. Prerequisite(s): consent of instructor. May be repeated for credit.

EENG 2910. Project III: Digital System Design. 2 hours. Digital system design projects that provide students substantial experience in logic analysis, design, logic synthesis in VHDL, and testing. Project documentation including all the phases of project cycle from requirement analysis to testing as well as a project presentation providing the students an opportunity to enhance their communication and presentation skills, are essential components of this course. Instructor may choose to include a mini-project for breadboard implementation with discrete components as a part of this course. Prerequisite(s): EENG 2710.

EENG 2920. Project IV: Analog Circuit Design. 2 hours. Students learn to use basic electrical engineering lab equipment, to build and test simple circuits in the lab and to design and analyze circuits using CAD software tools. Includes simulation and design experiments and a final comprehensive design project to complement the circuit analysis course. Prerequisite(s): EENG 1920 and EENG 2610.

EENG 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 MATH 3310.

EENG 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.

EENG 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.

EENG 3710. Computer Organization. 3 hours. Principles of computer system organization, instruction sets, computer arithmetic, data and control paths, memory hierarchies. Prerequisite(s): CSCE 1020 and EENG 2710.

EENG 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; EENG 3510; and MATH 1780 or MATH 3680. (Same as CSCE 3020.)

EENG 3910. Project V: DSP System Design. 2 hours. To study basic theory and applications of modern digital signal processing, to learn basic theory of real-time digital signal processing, and to develop ability to implement and simulate digital signal processing algorithms using MATLAB and on real-time DSP platform. Prerequisite(s): EENG 2620.

EENG 3920. Project VI: Modern Communication System Design. 2 hours. Students are required to design electronic communication systems with electronic devices such as MOS transistors, capacitors and resistors. Topics include LC circuits and oscillators, AM modulation, SSB communications and FM modulation. Corequisite(s): EENG 3520.

EENG 4010. Topics in Electrical Engineering. 3 hours. Technical elective specifically designed by the instructor each term/semester to cover topics in the latest state-of-the-art technology advancements in electrical engineering. Prerequisite(s): consent of the instructor. May be repeated for credit. Maximum total number of repeat hours allowed is 6 hours.

EENG 4710. VLSI Design. 3 hours. Introduction to VLSI design using CAD tools, CMOS logic, switch level modeling, circuit characterization, logic design in CMOS, systems design methods, test subsystem design, design examples, student design project. Prerequisite(s): EENG 2710 and EENG 3510. (Same as CSCE 4730.)

EENG 4810. Computer Networks. 3 hours. History and overview of computer networks, protocols and network layers, application layer, socket programming, transport layer protocols and TCP, network layer protocols and IP, network routing, data link and physical layers, introduction to network security. Prerequisite(s): EENG 3810 and MATH 3680.

EENG 4900. Special Problems in Electrical Engineering. 1–3 hours. Individualized instruction in theoretical or experimental problems in electrical engineering. For elective credit only. Prerequisite(s): consent of instructor. May be repeated for credit.

EENG 4910. Project VII: Senior Design I. 3 hours. The senior design project course is a comprehensive electrical engineering design course providing major design experience. Students form teams of two to three members and work under the supervision of a faculty advisor. Identifying, formulating and solving an electrical engineering design problem of practical value under realistic design and implementation constraints by conforming to the engineering standards wherever appropriate. Development of an awareness of contemporary issues and professional ethics. Each project team is required to submit a proposal, present and submit a mid-term progress report, and present and submit a final report according to a prescribed project schedule. Prerequisite(s): EENG 3810, EENG 3910, and EENG 3920; consent of instructor.

EENG 4920. Cooperative Education in Electrical Engineering. 1–3 hours. Supervised field work in a job directly related to the student's major field of study or career objective. Prerequisite(s): junior- or senior-level standing in electrical engineering. May be repeated for credit.

EENG 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.

EENG 4990. Project VIII: Senior Design II. 3 hours. The senior design project course is a comprehensive electrical engineering design course providing major design experience. Students form teams of two to three members and work under the supervision of a faculty advisor. Identifying, formulating and solving an electrical engineering design problem of practical value under realistic design and implementation constraints by conforming to the engineering standards wherever appropriate. Development of an awareness of contemporary issues and professional ethics. Each project team is required to submit a proposal, present and submit a mid-term progress report, and present and submit a final report according to a prescribed project schedule. Prerequisite(s): EENG 4910.

Electrical 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

CNET 1160. Construction Methods and Materials. 3 hours. (2;3) Introduction to the materials, systems, methods and procedures of building construction.

CNET 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.

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

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