ELECTRICAL ENGINEERING (EEEN)

EEEN 3310 Electromagnetic Theory
3 Semester Credit Hours (3 Lecture Hours)
An introduction to the theory of static and dynamic electromagnetic fields with a focus on engineering applications. Principles will be illustrated with applications in various areas. Topics include computational electromagnetics, transmission lines, antennas, electromagnetic interference, and signal propagation in high speed circuits.
Prerequisite: PHYS 2426, MATH 2415, 3315 and EEEN 3315.

EEEN 3315 Electrical Circuits II
3 Semester Credit Hours (3 Lecture Hours)
AC circuit analysis principles: AC generation, periodic functions, complex numbers, phasors, impedance and admittance, network theorems, power, frequency response, filters, transformers, and balanced three-phase systems; and use of analysis software.
Prerequisite: (ENGR 2305) or (ENGR 2460).

EEEN 3320 Introduction to Communication Theory and Systems
3 Semester Credit Hours (3 Lecture Hours)
Frequency domain and time domain response of linear systems; analog modulation methods including amplitude modulation, frequency modulation and phase modulation; signal and noise modeling using probabilistic descriptions; narrowband random processes and the performance of analog modulation techniques in the presence of noise; design of communication links.
Prerequisite: (ENGR 2305 and 2105 or ENGR 2460) and MATH 3345.

EEEN 3330 Control Systems I
3 Semester Credit Hours (3 Lecture Hours)
Introduction to control systems; open and feedback; Laplace transform and frequency response; control valves; electric motors; P, PI, and PID modes of control; analog and digital controllers Process characteristics; analysis of control systems; gain and phase margin; stability.
Prerequisite: (ENGR 2305 or 2460) and MATH 3311.

EEEN 3345 Electronic Devices and Circuits
3 Semester Credit Hours (3 Lecture Hours)
The applications of electronic devices, including linear and non-linear Op-Amp circuits, oscillators, wave-shaping circuits, active filters, rectifiers, voltage regulators, and power supplies; industrial electronics. Offered Fall and Spring.
Prerequisite: EEEN 3315.

EEEN 3350 Electronic Systems Design
3 Semester Credit Hours (3 Lecture Hours)
Principles of engineering design of electronic circuits and systems; time and frequency responses; network analysis; systems specifications; evaluation, testing, and verification; use of electronic design automation tools. Offered Fall and Spring.
Prerequisite: (ENGR 2305 or 2460) and (ENGR 2306 and EEEN 3315).

EEEN 3418 Microprocessors and Microcontrollers
4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)
Introduction to microprocessor/microcontroller architecture, assembly language programming, and interfacing. Topics include computer organization, addressing modes, instruction set, interrupts, timing, memory, and interfacing.
Prerequisite: COSC 1320 and (ENGR 2306 and 2106). Co-requisite: SMTE 0099.
EEEN 4345  Sensors and Systems
3 Semester Credit Hours (3 Lecture Hours)
(3:0) This course introduces sensors and sensing systems, and the acquisition, processing, and interpretation of signals obtained with selected sensors and systems. The course will also cover sensing modalities, signal transmission and reception. Measurement and uncertainty in sensors and systems will be discussed as applied to signal noise and interference. Filtering and estimation will be introduced. Sensing systems for vision, monitoring, and control applications will be surveyed. Sensor interfacing, signal conditioning and transforms will be applied. Other topics include multidimensional signal and image processing, object tracking, multisensor data fusion, applications in environmental monitoring, remote sensing and surveillance. Offered in alternating Fall semesters.
Prerequisite: (MATH 2414 and ENGR 2460).

EEEN 4396  Directed Independent Study
1-3 Semester Credit Hours
(1-3) Requires a formal proposal of study to be completed in advance of registration, approval of supervising faculty and department chairperson.

EEEN 4453  Mechatronics
4 Semester Credit Hours (3 Lecture Hours, 2 Lab Hours)
This course introduces a multidisciplinary field that combines electrical engineering, mechanical engineering, control systems and computer science. It presents key aspects in the design of systems, devices and products and it aims at the analysis of the behavior and control of the systems. Topics covered in this course bring together different areas of technology involving actuation systems, computer-aided design, sensors, signal conditioning, data acquisition, and programming. Course includes lab sessions related to acquiring experience with electronics, computer-aided design, programming, and control systems.