ELECTRICAL ENGINEERING (ENGE)

ENGE 201 Introduction to Logic Design 3 Credit Hour(s)
Prerequisite: ((CSIS 111 or CSCN 111) and (MATH 250 or (pre2016 post1995)SAT Math with a score of 600 or SAT Section Math with a score of 620 or ACT Math with a score of 27 or Placement Score-Math with a score of 075))
Introduction to combinational logic design, Boolean algebra, logic minimization, and Karnaugh maps with an emphasis on applying topics presented to design of registers, counters and finite state machines using CPLD's.
Offered: Resident

ENGE 205 Electrical Systems 3 Credit Hour(s)
Online Prerequisite: ENGR 115 and MATH 131 and PHYS 231
This course covers the fundamental concepts of Electricity (Direct Current, Energy, Voltage, and Power) as well as basic Electronics, which allows students to understand how circuits work. The course covers many important components to include resistors, capacitors and diodes as well as discovering the important laws which govern these concepts to include Ohm's law, Kirchhoff's law, etc.
Offered: Online

ENGE 211 Introduction to Electrical and Electronic Circuits 4 Credit Hour(s)
Prerequisite: ENGR 110 and (MATH 131 or ENGR 131)
An introduction to lumped-parameter circuit elements in DC circuits. Topics include resistors (R), independent and dependent sources, capacitors (C), inductors (L), equivalent networks. Introduction to fundamental techniques used in DC circuit analysis, including Laplace transforms. Semiconductor electronic devices will also be introduced, with the focus being on the terminal characteristics of such devices. The two-terminal diodes (D) and the three-terminal transistors (Q) are studied in DC circuits. Laboratory experiments are an essential and integral part of the theory students will learn in this course. Experiments will focus on building, measuring, and calculating the predicted responses of DC circuits containing all of the above mentioned elements, and transient analysis of circuits containing R, L, and C circuit elements.
Offered: Resident

ENGE 212 AC Circuit Analysis 4 Credit Hour(s)
Prerequisite: MATH 132 and ENGE 211
An introduction to AC circuit analysis using phasors in conjunction with the techniques covered in ENGE 211. Topics include AC steady state analysis, AC power, three phase circuits, and advanced circuit analysis using Fourier analysis. Semiconductor electronic devices will also be introduced, with the focus being on the terminal characteristics of such devices. The two-terminal diodes (D) and the three-terminal transistors (Q) are studied in AC circuits. Laboratory experiments are an essential and integral part of the theory students will learn in this course. Experiments will focus on building, measuring, and calculating the predicted responses of AC circuits. Minimum grade of "C."
Offered: Resident

ENGE 299 Internship 0 Credit Hour(s)
Placement in an electrical engineering or related organization for a controlled learning experience within the student's career specialization area. Application procedures processed through the Career Center. Must apply semester prior to internship.
Registration Restrictions: Sophomore status, 2.00 GPA, two courses in major, declared major, not more than one CSER behind
Offered: Resident

ENGE 311 Signals and Systems 3 Credit Hour(s)
Prerequisite: ENGE 212 and (MATH 321 or MATH 221)
Analysis techniques for system and signal modeling using numerical analysis software. Topics include introduction to convolution, Fourier series, Fourier transforms, LaPlace transforms with application to determine system response, filters, sampling, linearity, time invariance and stability.
Offered: Resident

ENGE 312 Digital Signal Processing 3 Credit Hour(s)
Prerequisite: ENGE 311
This course is designed to introduce students to discrete-time systems and signal processing with emphasis on digital filter designs. Topics include, but are not limited to: sampling and reconstruction of continuous-time signals, fundamental characteristics of discrete-time signals and systems, difference equations, z-transform, discrete-time Fourier transform (DTFT), discrete Fourier transform (DFT), fast Fourier transfer (FFT), and analysis, design, and realization of digital filters.
Offered: Resident

ENGE 321 Electronics 4 Credit Hour(s)
Prerequisite: ENGE 212
Introduction to electronic devices including diodes, transistors and operational amplifiers and their applications in electrical circuits.
Offered: Resident

ENGE 331 Electromagnetic Fields 4 Credit Hour(s)
Prerequisite: ENGE 212 and MATH 334
Fundamentals of electromagnetic theory and modern transmission systems. Maxwell's equations are formulated and applied to electromagnetic problems including plane-wave propagation, reflection and transmission at discontinuous boundaries and basic transmission line theory.
Offered: Resident

ENGE 341 Communications Systems 3 Credit Hour(s)
Prerequisite: ENGR 210 and MATH 231 and ENGE 311
Analysis and design of communication systems and transmission of information over various medium. Topics include modulation, sampled signals, conversion (ADC and DAC), random processes and noise.
Offered: Resident

ENGE 351 Power Systems 3 Credit Hour(s)
Prerequisite: ENGE 321
Basic concepts of AC systems. Topics include single-phase and three-phase networks, electric power generation, transformers, transmission lines, electric machinery and the use of power.
Offered: Resident

ENGE 411 Control Systems 3 Credit Hour(s)
Prerequisite: ENGE 311 and ENGR 133
An introduction to both the classical and the modern control theories, with an emphasis on constant-coefficient linear control systems and state function. Topics include, but are not limited to: classical feedback control systems, controller sensitivity and disturbance rejection, transfer matrices, feedback control of first- and second-order systems, stability analysis, frequency response methods, state equations, linear transformations, state-variable feedback, eigenvalue placement, controllability, observability, and observer design for linear control systems.
Offered: Resident

ENGE 421 Advanced Electronics 3 Credit Hour(s)
Prerequisite: ENGE 321
Application of advanced design methods used to achieve gain and bandwidth specifications in amplifiers. Topics include use of feedback techniques, and design specifications of operational amplifiers.
Offered: Resident

ENGE 431 Electromagnetic Compatibility 3 Credit Hour(s)
Prerequisite: ENGE 331
Introduction to the Electromagnetic fields of passive components and Electromagnetic compatibility regulations and measurements. Topics include radiated signals, electromagnetic waves, transmission lines, conducted emissions, radiated emissions, electromagnetic shielding and grounding, and Electrostatic discharge. (Elective)
Offered: Resident

ENGE 481 Electrical Engineering Design I 3 Credit Hour(s)
Prerequisite: (MATH 234 or MATH 334) and ENGE 201 and ENGE 211 and ENGE 212 and ENGE 311 and ENGE 321 and ENGE 331 and ENGI 220 and ENGR 210 and ENGR 270 and MATH 131 and MATH 132 and MATH 231 and PHYS 231 and PHYS 232
This is the first senior design course where students are exposed to engineering design and product/process development. Students work in teams on engineering design projects from inception to completion to satisfy the needs and requirements of the clients. In addition to technical design, factors such as safety, economics, and ethical and societal implications are considered.
Note: ENGE 481 and ENGE 482 represent two parts of the same project; therefore, they must be taken in consecutive terms.
Offered: Resident

ENGE 482 Electrical Engineering Design II 3 Credit Hour(s)
Prerequisite: ENGE 481
This is the second senior design course where students are exposed to engineering design and development. Design process culminates in prototype manufacturing, testing and validation, design improvement, producing a successful prototype/process/set of design plans and specifications, and presenting to peers, clients, and faculty members.
Note: ENGE 481 and ENGE 482 represent two parts of the same project; therefore, they must be taken in consecutive terms.
Offered: Resident

ENGE 496 Special Topics in Electrical Engineering 3 Credit Hour(s)
Prerequisite: Electrical Engineerng Gate Req with a score of 5
Selected topics in various areas of Electrical Engineering. May be repeated for credit when topic varies.
Offered: Resident

ENGE 497 Special Topics in Electrical Engineering 3 Credit Hour(s)
Selected topics in various areas of Electrical Engineering. May be repeated for credit when topic varies.
Offered: Resident

ENGE 499 Electrical Engineering Internship 1-6 Credit Hour(s)
Placement in an electrical engineering or related organization for a controlled learning experience within the student's career specialization area. Applications are processed through the department Faculty Intern Advisor. Applicants must apply the semester prior to starting the internship.
Registration Restrictions: Permission of the instructor
Offered: Resident