

# ELECTRICAL ENGINEERING (ENGE)

## ENGE 201 Introduction to Logic Design 3 Credit Hour(s)

**Prerequisite:** CSIS 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

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 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