

ELECTRICAL ENGINEERING (EENG)

EENG1210 | Logic & Digital Design | Lecture (2 Credits)

Introduction to logic gates and state machines. The foundations of number systems and binary logic are implemented using logic gates. Karnaugh maps are used to realize Boolean algebra, leading to combinational logic circuits. State machines such as flip-flops, counters, and registers are analyzed.

Corequisite(s): EENG1220

EENG1220 | Logic & Digital Design Lab | Laboratory (1 Credit)

Build logic circuits and state machines in a laboratory environment from scratch using components such as IC chips and breadboards. Measure inputs and outputs using oscilloscopes and logic analyzers. Explore potential uses and implementations for real world solutions. Model design with Hardware Description Language coding.

Corequisite(s): EENG1210

EENG1240 | Circuit Fundamentals I | Lecture (3 Credits)

Analyze fundamental circuits. Investigate the relationship between voltage, current, power and energy. Identify and predict responses of RC and RL circuits. Must be taken with EENG1241.

Corequisite(s): EENG1241

EENG1241 | Circuit Fundamentals I Lab | Laboratory (1 Credit)

Analyze fundamental circuits in a lab environment. Investigate the relationship between voltage, current, power and energy. Identify and predict responses of RC and RL circuits. Must be taken with EENG1240.

Corequisite(s): EENG1240

EENG2111 | Circuit Fundamentals | Lecture (3 Credits)

Examine transient and steady state conditions in complex circuits. Investigate power, power factor, and power transfer. Explore frequency using Fourier analysis, Bode plots, passive filters and transfer functions.

Prerequisite(s): ENGR1221

EENG2112 | Circuit Fundamentals II | Lecture (3 Credits)

Examine transient and steady state conditions in complex circuits. Investigate power, power factor, and power transfer. Explore frequency using Fourier analysis, Bode plots, passive filters and transfer functions.

Prerequisite(s): EENG1240

Corequisite(s): EENG2122

EENG2120 | Circuit Fundamentals Lab | Laboratory (1 Credit)

Prototype various circuits and determine values using electrical metrology tools and techniques. Compare expected behavior against measured responses.

Prerequisite(s): ENGR1221

EENG2122 | Circuit Fundamentals II Lab | Laboratory (1 Credit)

Prototype various circuits and determine values using electrical metrology tools and techniques. Compare expected behavior against measured responses.

Prerequisite(s): EENG1240 And EENG1241

Corequisite(s): EENG2112

EENG2132 | Digital Systems | Lecture/Laboratory (3 Credits)

Examine various systems through abstraction from the basic concepts of digital blocks. Use hardware description languages such as Verilog to design the digital systems. Work with memory and programmable logic devices and FPGAs to design and program reconfigurable systems.

Prerequisite(s): EENG1210

EENG2210 | Analog Circuits | Lecture (3 Credits)

Analysis of continuous variable systems. Discuss non-linear components such as diodes and transistors. Explore more advanced concepts and components including multi-transistor amplifiers and op-amps.

Prerequisite(s): EENG2110

Corequisite(s): EENG2220

EENG2220 | Analog Circuits Lab | Laboratory (1 Credit)

Design and construct circuits, focusing on prototyping and debugging, using common electrical engineering equipment and tools.

Prerequisite(s): EENG2120

Corequisite(s): EENG2210

EENG3110 | Advanced Analog Circuits | Lecture (3 Credits)

Evaluate various typologies of circuits and determine useful implementations. Practical design considerations include physical constraints, non-ideal characteristics of transistors, active loads, frequency response, and feedback.

Prerequisite(s): EENG2210

Corequisite(s): EENG3120

EENG3120 | Advanced Analog Circuits Lab | Laboratory (1 Credit)

Design, model, prototype, and fabricate project(s) in an interactive applied lab.

Prerequisite(s): EENG2220

Corequisite(s): EENG3110

EENG3131 | Signals & Systems | Lecture (3 Credits)

Introduction to the foundation of communications, signal processing and control theory. Analyze linear time invariant continuous and discrete systems and signal transformations, convolution, frequency spectra, Laplace transforms, Z transforms, and fast Fourier transforms.

Prerequisite(s): MATH2820

EENG3150 | Topics in Applied Instrumentation | Lecture/Laboratory (3 Credits)

Introduction to various types of instrumentation and control schemas. Topics include pressure, temperature, level and flow detection and calculations. Lab activities include calibration, tuning and installation of various analog and smart equipment used in industry.

Prerequisite(s): EENG3110

EENG3211 | Digital & Microprocessors Systems | Lecture (3 Credits)

Investigate microprocessor and microcontroller operations. Explain registers, memory and I/O interfacing principles. Describe embedded systems and their applications in real world systems. Utilize microprocessor/microcontroller for embedded system Hardware/Software development.

Prerequisite(s): EENG2132

Corequisite(s): EENG3220

EENG3220 | Digital & Microprocessors Systems lab | Laboratory (1 Credit)

Implement embedded systems using different hardware platforms and different programming languages. Demonstrate the design considerations for systems ranging from basic to complex applications.

Prerequisite(s): EENG2132

Corequisite(s): EENG3211

EENG3260 | Motors & Controls | Lecture/Laboratory (4 Credits)

Examine the fundamentals of electrical motor control components, circuits and systems. Topics include electrical control symbols, power distribution, control transformers, solenoids and relays, motor starters, pilot devices, timers and sequencers, DC and AC motor principles, proximity sensors and troubleshooting.

Prerequisite(s): EENG3110

EENG4110 | Communication Systems | Lecture (3 Credits)

Apply signal and system theory to analog and digital communication. Distinguish characteristics of contemporary communication standards.

Prerequisite(s): EENG3110, EENG3131, And EENG3211

Corequisite(s): EENG4120

EENG4120 | Communication Systems Lab | Laboratory (1 Credit)

Implement and evaluate electrical communication systems in an investigative laboratory.

Prerequisite(s): EENG3110, EENG3131, EENG3211, And MATH2260

Corequisite(s): EENG4110

EENG4141 | Power System Analysis & Design | Lecture/Laboratory (4 Credits)

Examine how modern power systems are designed, implemented and controlled. Explain the power system in terms of reliability, safety and maintainability. Modeling and simulation are used in the analysis and conceptual design and study of regulatory codes related to power systems.

Prerequisite(s): EENG3260

EENG4150 | Senior Design Project I | Capstone (2 Credits)

Investigate current real world electrical engineering industries, applications, and challenges. Prepare and present a project proposal to an industry panel. Discuss best practices in project management. Projects will be executed in the following semester.

EENG4231 | DSP & Filters | Lecture (3 Credits)

Analyze Discrete-time signals and systems. Design and implement Digital Filters. Compute Signal Spectrum using FFT algorithms. Implement DSP solutions using industry standard solutions and design tools offered by companies such as Texas Instruments, and ON Semiconductor. Contrast DSP and Microprocessor solutions in meeting performance standards.

Prerequisite(s): EENG4110

EENG4250 | Senior Design Project II | Capstone (4 Credits)

Execute project proposal from Senior Project I. Construct a working prototype. Display of project documentation. Present to a jury of peers, faculty and industry representatives.