

# ELECTRONICS (ELC)

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Division: Mathematics, Engineering Technologies and Computer Sciences (METCS) Division

## ELC 115 Electric Circuits: DC and AC (3 Credits)

This introductory course in circuit analysis defines the electrical quantities, current, and voltage, and examines their relationship in various components and circuits. Circuits comprised of resistance, capacitance, and inductance which are energized by both DC and AC sources are considered. The theory includes Ohm's Law, Kirchhoffs Laws, series and parallel circuits, and several network theorems. In the laboratory the student performs electrical measurements which confirm his/her grasp of the theory. A circuit simulation computer software package is introduced and used as an analytical tool.

## ELC 120 Fundamentals of Analog ELC (3 Credits)

This course introduces students to the active components used in electronics circuits. It covers the physics, the characteristics, and some applications of semiconductor diodes and transistors. The emphasis is on transistor biasing circuits. These devices and their applications are also studied through laboratory experiments.

**Pre-requisites:** ELC 115 with a minimum grade of C

## ELC 211 Electromechanical Devices (3 Credits)

This course treats in detail the subject of electrical power including its generation, distribution, and utilization. It presents the theory, construction, maintenance, and characteristics of AC and DC motors, generators, and transformers. The associated laboratory is an integral part of the course.

**Pre-requisites:** ELC 115 with a minimum grade of C

## ELC 218 Pulse and Digital Circuits (3 Credits)

This course is an introduction to computer electronics. It includes Boolean algebra, fundamentals of logic, logic circuits, and digital logic systems. Laboratory work is closely allied with theory and includes computer simulation.

**Pre-requisites:** MTH 113 with a minimum grade of C or MTH 120 with a minimum grade of C

## ELC 221 Electronics II : Amplifiers (3 Credits)

This course extends ELC 120 to include AC analysis of transistor circuits. Electronic amplification is examined in considerable detail. Field effect transistors (FET) and integrated circuits (IC) are introduced. Laboratory work, complementing the theoretical work, is emphasized.

**Pre-requisites:** ELC 120 with a minimum grade of C

## ELC 222 Intro to Communication Systems (3 Credits)

This is the final course in the electronics sequence. Topics covered include modulation and demodulation for AM, FM, PM, and TV. Transmitters, receivers, and transmission characteristics are studied. Concepts of information theory, waveform analysis, and noise are introduced

## ELC 224 Linear Electronic Systems (3 Credits)

This course introduces the basic theory and mathematical tools for analyzing Linear Electronic Systems. Areas covered include feedback concepts, frequency-response, transfer functions, and Bode diagrams. Laboratory experiments are performed to support the theory.

**Pre-requisites:** ELC 115 with a minimum grade of C

## ELC 228 Intro to Microprocessors (3 Credits)

This is an introductory course in microprocessor applications for students who already have basic knowledge of digital circuit's principles. Computer hardware organization is analyzed, and machine-language programs are written and run. Hardware and software aspects of a popular eight-bit microprocessor are studied in detail. Theoretical ideas are reinforced by building and testing realistic experimental systems in the laboratory.

**Pre-requisites:** ELC 218 with a minimum grade of C

## ELC 230 Circuits & Systems for Engr. (3 Credits)

This is a calculus-based course in electric circuit theory and analysis for Engineering AS degree program students interested in pursuing computer or electrical engineering. It includes DC and AC principles with an emphasis on Kirchhoff's Laws, network theorems for resistive, capacitive, and inductive networks, mesh and nodal analysis, and sinusoidal steady-state analysis. Also, power, resonance, and ideal transformers are studied. The theory is reinforced with instructor-run demos. Assignments include the use of circuit analysis computer software.

**Pre-requisites:** PHY 104 with a minimum grade of C and MTH 122 with a minimum grade of C