

0906200 Electrical Circuits for Energy (3-0-3)

Prerequisite: 0300122 General Physics 2

The electric circuit components. Atoms, current, voltage, and resistance. Types of resistors. Ohm's law. Power and energy. Energy losses and voltage drop. Series, parallel, and series-parallel resistive circuits. Kirchhoff's current and voltage laws. Circuit analysis methods (branch current, mesh current, and node voltage. Thevenin's theorem. Sine wave characteristics. Capacitance characteristics, connections and types. Electromagnetism, electromagnetic inductance, types and characteristics of inductors. Complex numbers. Arithmetic of complex numbers. Resistance and reactance in complex form. Total impedance in complex form. Complex analysis of reactive circuits. Frequency response to R-C and R-L circuits. Series and parallel resonance.