

ENGR: ENGINEERING (ENGR)

ENGR 101. Introduction to Engineering I. (2 Credits)

Introduction to the engineering profession, Introduction to problem solving using analytical, graphical, and computer tools including scientific word processors, spreadsheets and database packages, mathematical computation software. Introduction to logic. Engineering ethics and professional responsibilities. This course includes lab sessions.

ENGR 102. Introduction to Engineering II. (2 Credits)

Introduction to problem solving using analytical, graphical, and computer tools including scientific word processors, spreadsheets and database packages, mathematical computation software. Introduction to engineering analyses. Engineering ethics and professional responsibilities. This course includes lab sessions. Prerequisite: ENGR 101 Introduction to Engineering I.

ENGR 200. Engineering Graphics. (3 Credits)

Fundamentals laws of circuit analysis. Ohm's Law, Kirchhoff's current and voltage laws, the law of conservation of energy, circuits containing independent and dependent voltage and current sources, resistance, conductance, capacitance and inductance analyzed using mesh and nodal analysis, superposition and source transformations, and Norton's and Thevenin's Theorems. Steady state analysis of DC and AC circuits. Complete solution for transient analysis for circuits with one and two storage elements. Prerequisite: MATH 260 Calculus I. Co-requisite: ENGR 221 Analog Circuits Laboratory.

ENGR 201. Circuit Analysis. (3 Credits)

Fundamentals laws of circuit analysis. Ohm's Law, Kirchhoff's current and voltage laws, the law of conservation of energy, circuits containing independent and dependent voltage and current sources, resistance, conductance, capacitance and inductance analyzed using mesh and nodal analysis, superposition and source transformations, and Norton's and Thevenin's Theorems. Steady state analysis of DC and AC circuits. Complete solution for transient analysis for circuits with one and two storage elements. Prerequisite: MATH 260 Calculus I. Co-requisite: ENGR 221 Analog Circuits Laboratory.

ENGR 203. Introduction to Programming. (3 Credits)

An introduction to the computer, the algorithmic process, and computer programming using standard control structures.

ENGR 204. Intro to Object Oriented Progr. (3 Credits)

Advanced program design and implementation in a programming language. Object-oriented programming with concepts including class structure and behavior, objects, inheritance and reuse, virtual functions and polymorphism, exception handling, and templates.

ENGR 210. Statics & Strength Materials. (3 Credits)

The first part of this course covers the application of the principles of engineering mechanics to problems involving equilibrium of particles and solids. Topics include resultants, equilibrium, friction, trusses, center of gravity and moments of inertia. The second part of this course introduces the principles of mechanics necessary for the solution of engineering problems relating to strength, stiffness and material selection. Topics covered include stress, strain, torsion, beams, columns and combined stresses at a point. Prerequisite: ENGR 101 Introduction to Engineering I. Co-requisite: MATH 261 Calculus II.

ENGR 221. Analog Circuits Laboratory. (1 Credit)

Measurement techniques and experiments on fundamental laws. Circuit analysis techniques including: Ohm's Law, Kirchhoff's current and voltage laws, the law of conservation of energy, Norton's and Thevenin's Theorems, mesh and nodal analysis, superposition, and source transformations. Reinforce the concepts learned in ENGR 201 Circuit Analysis. Co-requisite: ENGR 201 Circuit Analysis.

ENGR 301. Engineering Statistics. (3 Credits)

Engineering applications of the concepts of probability, statistical distributions, statistical analysis, regression and correlation analysis, analysis of variance and covariance, design of experiments. Prerequisite: MATH 260 Calculus I.

ENGR 304. Mechatronic System. (3 Credits)

An introduction to designing a mechatronics system that includes the integration of electrical and mechanical engineering principles within a unified framework. Topics include low-level interfacing of software with hardware, use of programming tools to implement real-time computation; digital logic; analog interfacing; measurement and sensing; and controllers.

ENGR 305. Materials Engineering. (3 Credits)

Structure of matter. Physical and mechanical properties of materials including metals, polymers, ceramics, composites, and electronic materials. Equilibrium diagrams. Heat treatments, material selection and testing and corrosion phenomena. Prerequisite: CHEM 151.

ENGR 310. Engineering Economics. (3 Credits)

Analysis of the time value of money as applied to the manufacturing environment. Economic analysis of engineering decisions. Determining rates of return on investments. Effects of inflation, depreciation and income taxes. Sensitivity, uncertainty, and risk analysis. Application of basic principles and tool of analysis using case studies. Prerequisite: MATH 260 Calculus I.

ENGR 313. Thermal Engineering. (3 Credits)

Basic concepts and definitions, properties of pure substance, work and heat, first law of thermodynamics, second law of thermodynamics, and introduction to conductive, convective, and radiative heat transfer. Prerequisite: PHYS 112 General Physics I. Co-requisite: MATH 350 Differential Equations.

ENGR 315. Dynamics. (3 Credits)

Kinematics of particles and rigid bodies. Rectilinear motion, Curvilinear motion, Coordinates systems, velocity, acceleration, relative motion. Newton's second law. Kinetics of particles, Angular momentum, Work-energy methods, Impulse and momentum. Vector mathematics where appropriate. Prerequisite: PHYS 112 General Physics I and ENGR 210 Statics/Strength of Materials.

ENGR 430. Quality Engineering. (3 Credits)

An analysis of the basic principles of quality control, including Total Quality Management and design and analysis of process control charts and sampling plans. Prerequisite: ENGR 301 Engineering Statistics.