

ENGINEERING (ENGR)

ENGR 100 Introduction to Engineering I (3 Credits)

Prerequisites: MTH 111Z or higher or minimum placement into Math Level 20.

Explores the spectrum of engineering programs along with professional and academic expectations. Builds basic team skills in a problem solving environment. Identifies significant academic tools and resources to advance critical thinking skills. Analyzes and fabricates possible solutions to engineering challenges.

ENGR 102 Introduction to Engineering II (3 Credits)

Prerequisites: MTH 111Z or higher or minimum placement into Math Level 20.

Recommended preparation: ENGR 100 and MTH 112Z.

Explores design strategies and design thinking to define multiple options to engineering problems that satisfy technical and social requirements. Practices professional engineering and communication skills that contribute to the success of teams. Applies appropriate hardware and software tools to implement one or more solutions to a design problem.

ENGR 103 Introduction to Engineering III (3 Credits)

Prerequisites: MTH 111Z or higher minimum placement into Math Level 20.

Recommended preparation: ENGR 100 and ENGR 102.

Introduces fundamental computational concepts and practices with algorithmic thinking in the context of engineering problem solving. Explores problem-solving skills, algorithm design, debugging, and writing programs using universal design principles. Examines limitations in these problem solutions related to social or structural inequities. Applies these skills and insights through applications to engineering problems.

ENGR 199 Selected Topics: Engineering (1-6 Credits)

This course is in development.

ENGR 201 Electrical Fundamentals (4 Credits)

Recommended preparation: PH 202, PH 212 and MTH 251Z, MTH 252Z.

Topics covered in this course include: DC and 1st order transient analysis, Ohm's Law, Kirchhoff's Law (KCL and KVL), nodal analysis, branch analysis, source transformations, Thevenin and Norton equivalent circuits, maximum power transfer, operational amplifiers, inductance, capacitance, and transient response of RL and RC.

ENGR 202 Electrical Fundamentals II (4 Credits)

Recommended preparation: ENGR 201 and MTH 251Z, MTH 252Z.

Topics covered in this course include: AC and 2nd order transient analysis, sinusoids and phasors, sinusoidal steady-state analysis, nodal analysis, branch analysis, source transformations, Thevenin's and Norton's equivalent circuits, sinusoidal steady-state power calculation, and balanced three-phase circuits.

ENGR 211 Statics (4 Credits)

Prerequisites: MTH 251Z and PH 211.

Analyzes forces induced in structures and machines by various types of loading.

ENGR 212 Dynamics (4 Credits)

Prerequisites: ENGR 211 and MTH 252Z.

Studies kinematics, Newton's law of motion, and work-energy and impulse-momentum relationships as applied to engineering systems.

ENGR 212S 3D Dynamics for Mechanical Engineers (1 Credit)

Prerequisites: ENGR 211; PH 211; and MTH 252Z.

Prerequisites with concurrency: ENGR 212.

Recommended preparation: PH 213.

Introduces and applies concepts of kinematics and kinetics of particles and rigid bodies in 3 dimensions, with applications to mechanical systems of current interest to engineers.

ENGR 213 Strength Of Material (4 Credits)

Prerequisites: ENGR 211 and MTH 252Z.

Studies properties of structure materials. Analyzes stress and deformation in axially-loaded members, in circular shafts and beams and in statically indeterminate systems containing these components.

ENGR 298 Independent Study: Engineering (1-6 Credits)

Prerequisites: Instructor approval required.

Recommended preparation: Prior coursework in the discipline.

Individualized, advanced study in engineering to focus on outcomes not addressed in existing courses or of special interest to a student. P/NP grading.

ENGR 299 Selected Topics: Engineering (1-6 Credits)

Provides a learning experience in engineering not currently available; this course is in development to be proposed as a permanent course.