

# ENGINEERING (ENGR)

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## ENGR-105 Engineering Graphics

### 2 Credits

**Lecture:** 2 hours per week, **Lab:** 2 hours per week

**Offering:** Fall Only, All Years

This course provides instruction in computer aided engineering drafting with emphasis on visualization of points, lines, planes, and solids in space; freehand sketching; orthographic projection; isometric and oblique drawing; sectioning; dimensioning; descriptive geometry; and 3D modeling. It provides engineering students with beginning skills in computer aided engineering drawing, but is not intended to train AutoCAD technicians.

**Prerequisites:** MATH-025, MATH-090 or an appropriate score on a placement test.

**Corequisites:** ENGR-105L

## ENGR-123 Introduction to Engineering

### 2 Credits

**Lecture:** 1 hour per week, **Lab:** 3 hours per week

**Offering:** Fall and Spring Only, All Years

This course allows students to explore careers and opportunities in engineering and technology. Topics covered include becoming an engineer, the history, opportunities and potential fields, and career paths in engineering. This course is conducted using lectures, discussions, research, projects, guest speakers, and at least one field trip. This course will also allow students to experience the design process and engineering problem solving, as well as graphical analysis, data analysis, and oral and written communication skills.

## ENGR-210 Statics

### 3 Credits

**Lecture:** 3 hours per week

**Offering:** Fall and Spring Only, All Years

This course is a study of vector analysis, resolution of forces, free body diagrams, equilibrium, friction, centroids, moments of inertia and statics of rigid bodies, trusses, frames, machines, and cables. The course provides basic engineering skills in mechanics necessary for analysis of structures and dynamics of rigid bodies.

**Prerequisites:** MATH-170, PHYS-211

## ENGR-214 Surveying

### 4 Credits

**Lecture:** 1 hour per week, **Lab:** 3 hours per week

**Offering:** Fall Only, Odd Years

This course presents theory and field applications of elementary surveying. It includes the use of instruments, error and precision, level circuits, running traverses, field calculations, boundary surveys, route surveys, construction surveys, triangulation, state coordinate systems, engineering astronomy, and photogrammetry. This course provides basic surveying skills that may help engineering students gain summer employment, but it is not intended as a preparation for direct entry into surveying occupations.

**Prerequisites:** MATH-147 or an appropriate score on a placement test.

**Corequisites:** ENGR-214L

## ENGR-220 Dynamics of Rigid Bodies

### 3 Credits

**Lecture:** 3 hours per week

**Offering:** Spring Only, All Years

This course is the study of kinematics and kinetics of particles and rigid bodies. Topics include position, velocity, acceleration, relative velocity and acceleration, translation and rotation by Newton's 2nd Law, energy, momentum methods, collisions, and vibrations. It provides basic engineering skills that apply to all machines and other engineering bodies in motion.

**Prerequisites:** ENGR-210, MATH-175

## ENGR-223 Engineering Analysis

### 3 Credits

**Lecture:** 2 hours per week, **Lab:** 2 hours per week

**Offering:** Fall Only, All Years

This course introduces a combination of numerical analysis skills, problem solving and design techniques, and various computer software as they are utilized in basic engineering applications. Students will utilize oral and written communication skills in presenting their solutions.

**Pre/Corequisites:** MATH-175

## ENGR-240 Circuits I

### 4 Credits

**Lecture:** 3 hours per week, **Lab:** 2 hours per week

**Offering:** Fall Only, All Years

This course presents a study of Ohm's Law, analysis methods, network theorems, Ideal Operational Amplifiers, and energy storage elements. Students will be able to apply principles of electrical circuits using hands-on lab activities and computers.

**Prerequisites:** MATH-175

**Corequisites:** ENGR-240L

## ENGR-241 Circuits II

### 4 Credits

**Lecture:**

**Offering:** Spring Only, All Years

This course presents a study of power, three phase, transformers, filters, Fourier transforms, and Laplace transforms. Students will be able to apply principles of electrical circuits using hands-on lab activities and computers.

**Prerequisites:** ENGR-240

**Corequisites:** ENGR-241L

## ENGR-295 Strength of Materials

### 3 Credits

**Lecture:** 3 hours per week

**Offering:** Spring Only, All Years

This course is the study of material strength, including elasticity, stress, strain, beam analysis, analysis of structural forms, torsion, deformation, modes of failure, and column analysis. The course provides a basic understanding of how structures and machines should be designed to prevent failure.

**Prerequisites:** ENGR-210, MATH-175