Engineering

(See also Computer Science)

ENGR 100 INTRODUCTION TO ENGINEERING

Introduction to the engineering profession and its different fields. The course explains the engineering education pathways and explores effective strategies for students to reach their full academic potential. It also provides an understanding of engineering processes and tools including experimentation, data analysis, and computer and communication skills. Emphasis is given to academic success strategies, technical communications, ethical considerations, and engineering design and analysis skills applied to illustrative projects and problems drawn from various engineering fields. A spreadsheet program (Microsoft Excel) and a high-level computer language (MATLAB or equivalent) are an integral part of the course. *Letter Grade Only. Degree Credit.*

Units: 3

Hours/semester: 32-36 Lecture; 48-54 Lab; 64-72 Homework

Prerequisites: MATH 130 or MATH 225

Transfer Credit: CSU, UC

C-ID: ENGR 110

ENGR 210 ENGINEERING GRAPHICS

This course covers the principles of engineering drawings in visually communicating engineering designs and an introduction to computer-aided design (CAD). Topics include the development of visualization skills; orthographic projections; mechanical dimensioning and tolerancing practices; and the engineering design process. Assignments develop sketching and 2-D and 3-D CAD skills. The use of CAD software is an integral part of the course. *Letter Grade Only. Degree Credit.*

Units: 4

Hours/semester: 48-54 Lecture; 48-54 Lab; 96-108 Homework

Prerequisites: MATH 130

Transfer Credit: CSU, UC

C-ID: ENGR 150

ENGR 215 COMPUTATIONAL METHODS FOR ENGINEERS AND SCIENTISTS

Covers the fundamentals of procedural programming and computational methods for science and engineering. Topics include induction, iteration and recursion; approximations, floating-point computations, introduction to data structures and object oriented programming. Students will be given laboratory projects that use the MATLAB programming language to solve problems and examples drawn from algebra, trigonometry, calculus and elementary physics. *Letter Grade Only. Degree Credit.*

Units: 3

Hours/semester: 32-36 Lecture; 48-54 Lab; 64-72 Homework

Prerequisites: MATH 251

Transfer Credit: CSU, UC

C-ID: ENGR 220

ENGR 230 STATICS

This course covers vector treatment of force systems acting on particles and rigid bodies; two- and three-dimensional problems; equilibrium problems involving trusses, frames, machines, distributed forces, fluid statics, internal forces and friction; centroids and moments of inertia; shear and moment diagrams for beams and virtual work. *Letter Grade Only. Degree Credit.*

Units: 3

Hours/semester: 48-54 Lecture; 96-108 Homework

Prerequisites: MATH 252 and PHYS 250

Transfer Credit: CSU, UC

C-ID: ENGR 130

ENGR 240 ENGINEERING DYNAMICS

This course covers the fundamentals of kinematics and kinetics of particles and rigid bodies. Topics include kinematics of particle motion; Newton's second law, work-energy and momentum methods; kinematics of planar and three-dimensional motions of rigid bodies; D'Alembert's principle, work-energy and momentum principles for rigid body motion; introduction to mechanical vibrations. *Letter Grade Only. Degree Credit.*

Units: 3

Hours/semester: 48-54 Lecture; 96-108 Homework

Prerequisites: ENGR 230

Transfer Credit: CSU, UC

C-ID: ENGR 230

ENGR 260 CIRCUITS AND DEVICES

An introduction to the theory and techniques of circuit analysis. Circuit laws and nomenclature, resistive circuits with DC sources, controlled sources, ideal operational amplifiers, natural and complete responses of first- and

second-order circuits, steady-state sinusoidal analysis, power calculations, amplifiers, and three-phase circuits. *Letter Grade Only. Degree Credit.*

Units: 3

Hours/semester: 48-54 Lecture; 96-108 Homework

Prerequisites: PHYS 260 and completion of, or concurrent enrollment in, MATH 275

Transfer Credit: CSU, UC

C-ID: ENGR 260

ENGR 261 CIRCUITS AND DEVICES LABORATORY

Introduction to the design, construction, and measurement of electrical circuits using electrical test and measurement instruments as well as circuit simulation software.
The course covers the interpretation of measured and simulated data based on principles of circuit analysis for DC circuits, complete response of first and second-order RLC circuits, and sinusoidal steady-state (AC) circuits. The course also includes the design, measurement, and analysis of circuits with diodes, rectifiers, transistors, and operational amplifiers *Letter Grade Only. Degree Credit.*

Units: 1

Hours/semester: 48-54 Lab

Prerequisites: Completion of, concurrent enrollment in ENGR 260

Recommended: Eligibility for ENGL 100.

Transfer Credit: CSU, UC

C-ID: ENGR 260 L

ENGR 270 MATERIALS SCIENCE

The internal structures and resulting behaviors of materials used in engineering including metals, ceramics, polymers, composites, and semiconductors. The course emphasizes developing the ability to select materials to meet design criteria and to understand the effects of heat, stress, imperfections, and chemical environments upon material properties and performance. Laboratory exercises provide observation of material structures and behaviors, experience operating testing equipment, and the preparation of experimental reports. *Letter Grade Only. Degree Credit.*

Units: 4

Hours/semester: 48-54 Lecture; 48-54 Lab; 96-108 Homework

Prerequisites: CHEM 210 and PHYS 250

Transfer Credit: CSU, UC

C-ID: ENGR 140B

ENGR 695 INDEPENDENT STUDY

Designed for students who are interested in furthering their knowledge via self-paced, individualized instruction provided in selected areas or directed study to be arranged with instructor and approved by the division dean using the Independent Study Form. Varying modes of instruction can be used -- laboratory, research, skill development, etc. For each unit earned, students are required to devote three hours per week throughout the semester. Students may take only one Independent Study course within a given discipline. *Grade Option (Letter Grade or Pass/No Pass). Degree Credit.*

Units: 0.5 - 3

Hours/semester: 24-162 Lab

Transfer Credit: CSU