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 111 SURVEYING
Theory and applications of plane surveying; office computations and design, operation of surveying field equipment, and production of engineering plans/maps. Topics include distances, angles, and directions; differential leveling; traversing; boundary and topographic surveys; volume/earthwork; horizontal and vertical curves; land description techniques; construction applications; and Global Positioning System (GPS). Field work using tapes, levels, transits, theodolites, total stations, and GPS. Letter Grade Only. Degree Credit.

Units: 4
Hours/semester: 48-54 Lecture; 48-54 Lab; 96-108 Homework
Prerequisites: MATH 130 or appropriate score on the College Placement Test or other multiple measures assessment.
AA/AS Degree Requirements: Math Competency
Transfer Credit: CSU, UC
C-ID: ENGR 180

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
Recommended: Eligibility for ENGL 100.
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
Recommended: Eligibility for ENGL 100.
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 130 or appropriate score on the College Placement Test or other multiple measures assessment.
AA/AS Degree Requirements: Math Competency
Transfer Credit: CSU, UC
C-ID: ENGR 180
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
Recommended: Eligibility for ENGL 100.
Transfer Credit: CSU, UC
C-ID: ENGR 260

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