ENGINEERING (ENGI)

ENGI-110 Introduction to Engineering **3 Units**

54 hours lecture; 54 hours total

This course introduces the major engineering disciplines, engineering decision-making and ethics, and factors for success in academic and professional settings. It provides general knowledge of engineering design, communications, problem solving, fundamental physical concepts, and computational engineering tools. Presents the relationship of engineering to materials, the environment, and mathematics. Speakers, field trips, and classroom activities expose students to the many ways engineering affects our lives and the variety of roles of engineers in society. Recommended for both technical and non-technical majors.

Transfers to both UC/CSU

ENGI-122 Engineering Graphics & Design **4 Units**

36 hours lecture; 108 hours lab; 144 hours total

Introduction to the engineering design process and graphical communications tools used by engineers. The fundamentals of orthographic projection, pictorial sketching, dimensioning and tolerancing, and their application in the solution of engineering problems. Use of the computer-aid design package, and AutoCAD, as an analysis, design and documentation tool.

Transfers to both UC/CSU

ENGI-160 Programming With MATLAB for Engineers and Scientists **3 Units**

36 hours lecture; 54 hours lab; 90 hours total

Prerequisite: *Completion of MATH-120 with a minimum grade of C.*

This course teaches computer programming using the MATLAB's syntax, control, and data structures. It includes object oriented programming techniques, introduces numerical techniques for scientific and engineering applications, and emphasizes optimal programming practices. Various aspects of the software life-cycle, including design, documentation, implementation, debugging, testing, and maintenance are introduced. Case studies and software projects are significant parts of the course.

Transfers to both UC/CSU

ENGI-199 Independent Study in Engineering **1-3 Units**

54-162 hours lab; 54-162 hours total

Study an area of engineering of special interest to student. May include advanced studies and projects begun in other engineering course or engineering related studies not normally included in formal course work.

Transfers to CSU only

ENGI-240 Properties of Materials **4 Units**

54 hours lecture; 54 hours lab; 108 hours total

Prerequisite: *Completion of CHEM-120 and PHYS-140 with a minimum grade of C.*

This is an introductory course on the properties of engineering materials and how their overall properties relate to internal structure. Topics include: atomic structure and bonding; crystal structure; phases and phase diagrams; properties (mechanical, electrical, magnetic, optical) and structure of metals, polymers, ceramics and composites; mechanical deformation and fracture; taxonomy systems; corrosion and processing methods.

Transfers to both UC/CSU

ENGI-241 Engineering Mechanics: Statics **3 Units**

36 hours lecture; 54 hours lab; 90 hours total

Prerequisite: *Completion of MATH-121 and PHYS-140 with a minimum grade of C.*

This course is a study of rigid bodies in static equilibrium when acted upon by forces and couples in two-dimensional and three-dimensional space. Topics include analysis of equilibrium of rigid bodies, trusses, frames, and machines, as well as the calculation of centers of mass, centroids, friction, distributed forces, beams, shear and moment diagrams, and moments of inertia.

Transfers to both UC/CSU

ENGI-242 Circuits 1 **4 Units**

54 hours lecture; 54 hours lab; 108 hours total

Prerequisite: *Completion of PHYS-240 with a minimum grade of C.*

Prerequisites or Corequisites: *Concurrent enrollment in or previous completion of MATH-222 with a minimum grade of C.*

An introductory course in the analysis of linear circuits containing resistors, inductors, capacitors, independent and dependent voltage, and current sources. Analysis techniques are developed from Kirchhoff's network theorems and include node and loop methods, superposition and source transformations. Thevenin's and Norton's theorems are applied to DC and AC circuits. Differential equations are used to find transient response. Periodic waveform analysis including evaluation of average and rms values. AC analysis techniques include sinusoids and phasors, the concept of impedance, frequency response, and resonance. Use of simulation software, ideal operational amplifiers and transformers, approximations at high and low frequencies, impedance matching, and three-phase circuits.

Transfers to both UC/CSU