



Engineering 051
Basic Technical Drawing

Unit(s): 3.0
Class Hours: 32 Lecture, 64 Laboratory total.
Principles of mechanical drawing including projections, views, dimensions, and conventions, utilizing sketches and computer drafting program. Designed for students with no prior mechanical drawing experience.

Engineering 100A (C-ID ENGR 110)
Introduction to Engineering

Unit(s): 2.0
Class Hours: 32 Lecture total.
Introduction to major fields of engineering (including mechanical, electrical, industrial, biomedical, aerospace, and others), the functions of an engineer, and the industries in which engineers work. Explains the engineering education pathways and explores effective strategies for students to reach their full academic potential. Presents an introduction to the methods and tools of engineering problem solving and design including the interface of the engineer with society and engineering ethics. Develops communication skills pertinent to the engineering profession. CSU/UC

Engineering 100B
Introduction to Architecture/Civil Engineering /Construction (AEC)

Unit(s): 2.0
Class Hours: 32 Lecture total.
Introduction to the Architectural, Civil Engineering, Construction (AEC) fields. Includes an overview of academic programs, career information and preparation requirements, virtual or in person field trips, and guest speakers. CSU

Engineering 103
Solidworks Basic Solid Modeling

Unit(s): 3.0
Class Hours: 48 Lecture total.
Introductory course in parametric solid modeling. This course will include a solid modeling overview, solid model construction techniques (extrude, revolve, fillet, chamfer, etc.), including the preparation of individual solid components and basic solid model assemblies. (Same as Manufacturing Technology 103.) CSU

Engineering 104
Solidworks Intermediate Solid Modeling

Unit(s): 3.0
Class Hours: 48 Lecture total.
Prerequisite: Engineering 103 or Manufacturing 103 with a minimum grade of C.
Intermediate course for solid modeling, includes a review of the introductory class and changes to the Solidworks interface. Instruction in the use of intermediate Solidworks part modeling skills such as assembly modeling and sub-assemblies is included. (Same as Manufacturing Technology 104.) CSU

Engineering 105
Solidworks Advanced Solid Modeling

Unit(s): 3.0
Class Hours: 48 Lecture total.
Prerequisite: Engineering 104 or Manufacturing Technology 104 with a minimum grade of C.
Advanced course for solid modeling includes a review of the intermediate class and changes to the Solidworks interface. Instruction in the use of Solidworks part modeling, assembly modeling, sub-assemblies, advanced photoworks and advanced animator emphasized. (Same as Manufacturing Technology 105.) CSU

Engineering 110
Advanced CAD Applications

Unit(s): 0.5 - 4.0
Class Hours: 24 - 192 Laboratory total.
Individual skill development for advanced students desiring to learn special applications using college licensed computer drafting and design software. Each 0.5 unit of credit requires 24 laboratory hours. Suggested preparation: Engineering 184. Grade: Pass/No Pass Only. Open Entry/Open Exit. CSU

Engineering 111
Basic Mechanical Blueprint Reading

Unit(s): 2.0
Class Hours: 32 Lecture total.
Reading and interpreting blueprints for manufacturing technologies. (Same as Manufacturing Technology 111.) CSU

Engineering 112
Society and the Built Environment

Unit(s): 3.0
Class Hours: 48 Lecture total.
An introductory course that explores the far-reaching impacts of society on the built environment. A multidisciplinary examination of western and non-western society's ethics, economics, culture, ecology, processes, technology and tools on trends and developments of the built environment. CSU

ENGINEERING (ENGR)

Engineering 012
AEC Print Reading

Unit(s): 3.0
Class Hours: 48 Lecture total.
Reading and interpreting blueprints for Architecture, Civil Engineering, Construction (AEC). Information in this course provides preparation for more advanced AEC coursework. Recommended for students with no prior course(s) in blueprint reading.

Engineering 027
Electronic Drafting

Unit(s): 3.0
Class Hours: 32 Lecture, 48 Laboratory total.
Fundamentals of electronic drafting. Includes symbols, schematics, cable drawings, logic diagrams, printed circuit board layout, and electromechanical design.

**Engineering 114****Geometric Dimensioning and Tolerancing**

Unit(s): 3.0

Class Hours: 48 Lecture total.

Prerequisite: Engineering 104 or Manufacturing 111 or Engineering 122 or Engineering 125 with a minimum grade of C.

Drawing interpretation utilizing geometric dimensioning and tolerancing (ANSI Y14.5) as applied in engineering, manufacturing, and inspection. (Same as Manufacturing Technology 114.) CSU

Engineering 115**Cooperative Work Experience Education-Occupational**

Unit(s): 1.0 - 4.0

Class Hours: 60 - 300 Lecture total.

This work experience course of supervised employment is designed to assist students to acquire desirable work habits, attitudes and skills in a field related to the students' major so as to enable them to become productive employees. This course also provides students with career awareness for jobs. 75 hours of paid work or 60 hours of un-paid work equals one unit of course credit. Student repetition is allowed per Title 5, Section 55253. Grade: Pass/No Pass Only. CSU

Engineering 118 (C-ID ENGR 180)**Surveying****Formerly: Engineering 118, Plane Surveying**

Unit(s): 4.0

Class Hours: 48 Lecture, 48 Laboratory total.

Prerequisite: Mathematics 160 or Mathematics 170 with a minimum grade of C or prerequisite may be satisfied by High School or College Trigonometry (C-ID MATH 851) or Precalculus (C-ID MATH 155) or High School transcribed Trigonometry or Precalculus with a minimum grade of C.

The course applies theory and principles 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; property/boundary surveys; topographic surveys/mapping; volume/earthwork; horizontal and vertical curves; land description techniques; and GPS. Extensive field work using tapes, levels, transits, theodolites, total stations, and GPS. Assists in passing the land surveyor-in-training exam. Completion of Mathematics 160 recommended. CSU

Engineering 119**Advanced Plane Surveying**

Unit(s): 4.0

Class Hours: 48 Lecture, 48 Laboratory total.

Prerequisite: Engineering 118 with a minimum grade of C; instructor may waive if student can show proof of industry experience in surveying equal or greater than Engineering 118.

Emphasis on coordinate geometry calculations. Route surveying with horizontal and vertical curves. Topographic surveying and mapping. Construction surveying. Introduction to geospatial technologies, boundary surveying and surveys of public lands. Field surveying projects. Assists student in passing the state land surveyor-in-training exam. Previous successful completion of Mathematics 160 recommended. CSU

Engineering 122**Engineering Drawing**

Unit(s): 3.0

Class Hours: 32 Lecture, 64 Laboratory total.

Principles of engineering drawing: projections, views, sections, dimensions, tolerancing, assemblies, manufacturing processes, engineering drafting practices. Utilizing sketches and computer drafting program. CSU/UC

Engineering 124**Advanced Drawing**

Unit(s): 3.0

Class Hours: 32 Lecture, 64 Laboratory total.

Recommended Preparation: Engineering 122 or Engineering 125 with a minimum grade of C.

Advanced topics in engineering drawing and design - working drawings, fasteners, cams, gears, auxiliary views, advanced sectioning, dimensioning, tolerancing. Utilizing sketches and computer drafting program. CSU/UC

Engineering 125**Engineering Graphics**

Unit(s): 3.0

Class Hours: 32 Lecture, 64 Laboratory total.

Prerequisite: Mathematics 160 with a minimum grade of C. May be satisfied by equivalent High School trigonometry class with minimum grade of C.

Includes principles of engineering drawings in visually communicating engineering designs in sketches, and an introduction to computer-aided design (CAD). Includes orthographic projections, dimensioning, tolerancing, section, design and graphical mathematics, utilizing sketches, introduction to 2D and 3D computer drafting program and the engineering design process. Assignments develop sketching and 2-D and 3-D CAD skill. The use of CAD software is an integral part of the course. Suggested preparation: Engineering 051 and 183 (may be taken concurrently). CSU/UC

Engineering 130A**CATIA Beginning Solid Modeling**

Unit(s): 3.0

Class Hours: 48 Lecture total.

Introductory course in parametric solid modeling CAD using CATIA software. Topics include: CAD overview, sketching, basic solid model creation (base features, pads, pockets, grooves, shafts, etc.) sketch constraints, reference elements, hole features, feature editing, assembly and drawing creation. (Same as Manufacturing Technology 130A.) CSU

Engineering 130B**CATIA Intermediate Solid Modeling**

Unit(s): 3.0

Class Hours: 48 Lecture total.

Recommended Preparation: Engineering 130A or Manufacturing 130A with a minimum grade of C.

Intermediate course in parametric solid modeling CAD using CATIA software. Topics: intermediate/ advanced level sketching & modeling (sweeps, ribs, slots), feature editing & transformation, assemblies, drafting workbench, surface modeling, and other CATIA modules. (Same as Manufacturing Technology 130B.) CSU

Engineering 132**Introduction to Robotics**

Unit(s): 2.0

Class Hours: 16 Lecture, 48 Laboratory total.

Introductory course in robotics. Topics include history of robotics, impact of robotics in modern engineering, industrial automation, emerging technologies, basic design, sensors, circuitry, actuators, mechanics, programming, and a hands-on robot design and construction project. CSU

Engineering 133**Introductory Electromechanical Engineering Technology**

Unit(s): 3.0

Class Hours: 32 Lecture, 64 Laboratory total.

Recommended Preparation: Engineering 103 and Mathematics 084 with a minimum grade of C.

Introductory course in electro-mechanical engineering technology with an emphasis on hands-on fabrication and testing. Topics include: basic design using CAD software and mechanics principles; introductory fabrication and testing of mechanical systems (mechanical elements, materials, fabrication processes, frames, fasteners, fluid systems, 3D printing, laser cutting, and other processes), and electrical systems (basic circuit analysis, construction, and measurement). CSU

**Engineering 134****Intermediate Electromechanical Engineering Technology**

Unit(s): 3.0

Class Hours: 32 Lecture, 64 Laboratory total.
Prerequisite: Engineering 133 with a minimum grade of C.

Intermediate course in electro-mechanical engineering technology with an emphasis on hands-on fabrication and testing. Topics include: design using CAD software and mechanics principles; intermediate level fabrication and testing of mechanical systems (machine elements, fabrication processes, rapid prototyping, assembly, measurement and inspection, and other processes), and electrical systems (circuit analysis, op amps, AC circuits, LEDs, soldering, circuit construction, use of DMM and oscilloscope). CSU

Engineering 135**Advanced Electromechanical Engineering Technology**

Unit(s): 3.0

Class Hours: 32 Lecture, 64 Laboratory total.
Prerequisite: Engineering 134 with a minimum grade of C.

Recommended Preparation: Engineering 103 and Engineering 158 with a minimum grade of C.

Advanced course in electro-mechanical engineering technology with an emphasis on hands-on fabrication and testing. Topics include: design using CAD software and mechanics principles; advanced level fabrication and testing of mechanical systems (drive systems, gears, linear motion elements, rapid prototyping systems, motor control, actuation, and other processes), and electrical systems (solid state devices, op amps, AC circuits, transducers, micro-controllers, circuit measurement devices). CSU

Engineering 136**LabVIEW Data Acquisition****Formerly: Engineering 136, Fabrication and Automation Techniques for Engineering Technology**

Unit(s): 2.0

Class Hours: 32 Lecture total.

Students will learn to use LabVIEW software, which is a commonly-used data-acquisition software in the manufacturing industry. The course prepares students for LabVIEW certification by National Instruments. CSU

Engineering 137**Engineering Design and Development**

Unit(s): 3.0

Class Hours: 32 Lecture, 64 Laboratory total.
Prerequisite: Engineering 133, Engineering 134, Engineering 135, and Engineering 136 with a minimum grade of C.

In this capstone course, teams of students will work together to design, construct, and test solutions to engineering problems. Topics include research, prototype development, simulation, rapid-prototyping, construction, testing and evaluation, data acquisition and analysis, technical reports and project presentation. CSU

Engineering 142**Architecture/Civil Engineering/Construction (AEC) Drawing****Formerly: Engineering 142, Architecture/Civil Engineering/Construction (AEC) Drafting Standards**

Unit(s): 4.0

Class Hours: 48 Lecture, 64 Laboratory total.
Recommended Preparation: Engineering 012 and Engineering 183

An introduction to conventional and computer aided drafting techniques in the relation of drawings for construction. Interpretation of details in construction drawings/blueprints and reference materials. Laboratory: Drafting plans for a residential building using the techniques introduced in the course. Includes ecological terms and concepts, BIM basics, and abbreviations. CSU

Engineering 143**Fundamentals of Construction Engineering/Construction (AEC) Drafting Standards**

Unit(s): 3.0

Class Hours: 48 Lecture total.

Overview of residential, commercial, institutional, industrial, and heavy civil construction and associated codes, standards, and ethical boundaries. Areas of focus to include type of foundations, materials, contract documents, working drawings and vocabulary. Includes an introduction to LEED/Green Construction. CSU

Engineering 154**Architecture/Civil Engineering/Construction (AEC) Parametric and BIM Applications**

Unit(s): 4.0

Class Hours: 48 Lecture, 64 Laboratory total.

This course covers AEC 3D Parametric applications for architectural, civil engineering, and construction drawings/documents. Includes BIM concepts, sustainable design, organization of projects, visualization and printing. Suggested preparation: Engineering 142 and 186. CSU

Engineering 156A**Beginning Robotic Welding**

Unit(s): 3.0

Class Hours: 32 Lecture, 48 Laboratory total.
Prerequisite: Welding 108 with a minimum grade of C.

The course is a basic programming course that teaches students how to safely manipulate the robot through proper use of the robotic controller and Teach Pendant. This course also introduces the student to the gas metal and flux cored arc welding process. Emphasis is placed on safe operating practices, handling and storage of compressed gases, process principles, component identification, various welding techniques, and base and filler metal identification. This course is an introduction to the beginning robotic/laser technology. (Same as Welding 156A.) CSU

Engineering 156B**Intermediate Robotic Welding**

Unit(s): 3.0

Class Hours: 32 Lecture, 48 Laboratory total.
Prerequisite: Welding 156A with a minimum grade of C.

The robotic welding course teaches students how to safely manipulate the robot through proper use of the robotic controller and Teach Pendant. Emphasis is placed on safe operating practices, handling and storage of compressed gasses, process principles, component identification and welding procedures. Students will be able to input welding procedures, jog frames, circular moves, weaving, copy-delete-commands, six point tool center and other activities related to the robotic welding process. (Same as Welding 156B.) CSU

Engineering 156C**Advanced Robotic Welding**

Unit(s): 3.0

Class Hours: 32 Lecture, 48 Laboratory total.
Prerequisite: Welding 156B with a minimum grade of C.

The Advanced Robotic Welding course teaches students how to safely manipulate the robot through proper use of the robot controller and Teach Pendant. Emphasis is placed on safe operating practices, handling and storage of compressed gasses, process principles, component identification and welding procedures. Students will be able to create programs in robotic welding safety, TPP Management, USER Frames, coordinated motion, TAST, TAST-RPM, position registers & offsets, touch & sensing and activities relating to the robotic welding process. (Same as Welding 156C.) CSU



Engineering 157A
Basic Robotic Programming

Unit(s): 3.0
Class Hours: 16 Lecture, 96 Laboratory total.
Prerequisite: Welding 108 with a minimum grade of C.
Corequisite: Concurrent enrollment in Welding 156A.

This is a basic programming course that teaches students how to safely manipulate an industrial robot through proper use of a controller. Topics include safe operating practices, linear movements, coordinate systems, Teach Pendant programming, and software/hardware integration. (Same as Welding 157A.) CSU

Engineering 157B
Intermediate Robotic Programming

Unit(s): 3.0
Class Hours: 16 Lecture, 96 Laboratory total.
Prerequisite: Welding 156 or Engineering 156 and Welding 157A or Engineering 157A with a minimum grade of C.
Corequisite: Concurrent enrollment in Welding 156B or Engineering 156B.

This course is a programming course that teaches students how to safely manipulate an industrial robot through proper use of a controller. Topics include safe operating practices, circular movements, robot set-up, advanced Teach Pendant programming and functions, and auxiliary hardware. (Same as Welding 157B.) CSU

Engineering 157C
Advanced Robotic Programming Welding

Unit(s): 3.0
Class Hours: 16 Lecture, 96 Laboratory total.
Prerequisite: Welding 156B or Engineering 156B and Welding 157B or Engineering 157B with a minimum grade of C.

This is an advanced programming course that teaches students how to safely manipulate an industrial robot through proper use of a controller. Topics include safe operating practices, logic commands, and coordinate systems, advanced Teach Pendant programming, network integration, simulations, and software/hardware integration. (Same as Welding 157C.) CSU

Engineering 158
Basic Machining Concepts and Operations

Unit(s): 3.0
Class Hours: 16 Lecture, 112 Laboratory total.

Fundamental operations on lathes, milling machines, grinders, and drill presses, including precision measurements and layout. Equips students with skills and theory necessary to enter or upgrade within the machinist trade. (Same as Manufacturing Technology 158.) CSU

Engineering 165
Introduction to Energy

Unit(s): 3.0
Class Hours: 48 Lecture total.

Students will gain a broad understanding of energy concepts, efficiencies, conservation, distribution, careers and cost-benefit analysis of energy resource use. The study of both renewable and non-renewable energy will be included. CSU/UC

Engineering 175
Introduction to Energy Analysis

Unit(s): 3.0
Class Hours: 48 Lecture total.

This course is focused on energy analysis with respect to energy conservation, energy auditing, and CA Title 24 requirements. Calculations will be performed manually and with the assistance of software applications. Career tracks in energy analysis will be explored. Energy concepts, heat loss calculations, basic solar concepts, site selection, design improvements, appliances, and utility systems will be covered within this course. CSU

Engineering 177
Green HVAC

Unit(s): 3.0
Class Hours: 48 Lecture total.

In this course students learn the basic principles of heating, ventilation, and air conditioning (HVAC) systems in commercial buildings, with an emphasis on energy efficiency and renewable energy. Topics include heat loss calculations, fuels and combustion, waste heat recovery, and maintenance considerations for these systems. CSU

Engineering 183
CAD I - Computer Aided Drafting

Unit(s): 3.0
Class Hours: 32 Lecture, 64 Laboratory total.

A first course in computer drafting focused on AutoDesk software, with AutoCAD as a base. Topics include display and file management, units, entities, object selection, advanced editing, layers, dimensions, text, graphic exchange, and phone apps. CSU/UC

Engineering 184
CAD II - Computer Aided Drafting

Unit(s): 3.0
Class Hours: 32 Lecture, 64 Laboratory total.
Recommended Preparation: Engineering 183 or industry CAD experience.

Intermediate course focused on Autodesk software, especially AutoCAD. Topics include including a variety of intermediate apps, blocks, hatches, attributes, inquiry, and 3-D introduction, plus smart phone use. CSU

Engineering 185
AutoCAD & Customization

Unit(s): 3.0
Class Hours: 32 Lecture, 64 Laboratory total.
Recommended Preparation: Engineering 184 with a minimum grade of C.

Advanced course in the use of CAD software customization. Topics include DXF format, scripts, macros, customizing and creating image tile menus. CSU

Engineering 186
AutoCAD 3-Dimensional Drawing

Unit(s): 3.0
Class Hours: 32 Lecture, 64 Laboratory total.
Use of AutoCAD's 3-dimensional software. Includes 3-D models, extruding to 3-D, coordinate space, filter, and dynamic viewing. Recommended preparation: Engineering 184. CSU

Engineering 187
Advanced 3-D Civil Cad

Unit(s): 3.0
Class Hours: 32 Lecture, 64 Laboratory total.
Recommended Preparation: Engineering 186

Advanced use of 3-Dimensional software for Civil Engineering applications. Includes: merging of models, advanced modeling, calculations, 3-dimensional rendering and presentation. CSU

Engineering 191
Civil CAD Concepts

Unit(s): 3.0
Class Hours: 32 Lecture, 64 Laboratory total.

Fundamental principles, operation techniques and practices of two dimensional design using MicroStation computer-aided drafting and design software emphasizing Civil Engineering applications to create, modify, store, and plot graphic data. CSU

Engineering 193
Microstation 3-D

Unit(s): 3.0
Class Hours: 32 Lecture, 64 Laboratory total.
Recommended Preparation: Engineering 191 with a grade of C or equivalent industry experience.

Theory, concepts, techniques and practices of three dimensional design using MicroStation computer-aided drafting and design software. Topics include surfaces, solids, shade, and color. Suggested preparation: Engineering 191. CSU



Engineering 195
Renewable Energy

Unit(s): 3.0

Class Hours: 48 Lecture total.

Students will be able to cite sustainable methods for improving the operational performance of offices, schools, hospitals, and other residential and commercial buildings. In this course, students learn the principles, methods, and equipment associated with renewable energy systems. Topics include solar, wind, biomass and biofuels, fuel cells, hydropower, oceanic energy, geothermal, and energy storage. Nonrenewable energy sources, climate change, and the economics and politics of energy are also discussed. CSU/UC

Engineering 201
Residential and Light Commercial Construction Practices and Estimating

Unit(s): 4.0

Class Hours: 48 Lecture, 64 Laboratory total.

Recommended Preparation: Engineering 100B, Engineering 112, and Engineering 142.

Course provides practical knowledge, ecological terms and concepts, for planning, design, and construction of residential and light commercial buildings including materials, equipment, construction/assembly methods, quantity take-off, and building codes/standards. CSU

Engineering 202
Cost Accounting for Construction Engineering

Unit(s): 3.0

Class Hours: 48 Lecture total.

Study of the theoretical and practical concepts of cost accounting. Topics include: variable and fixed costs, break-even point, interrelationships of cost, volume and profits; job-order accounting, general and flexible budgeting, standard costs; product costing methods; cost allocation; inventory planning; control and valuation; and joint products. (Same as Accounting 202.) CSU

Engineering 203
Sustainable Construction and Facilities Management

Unit(s): 3.0

Class Hours: 48 Lecture total.

This course provides students the means to apply core sustainable principles to each step within the facilities planning, design, and management process. It examines best practices for site and building: energy, conservation, reclamation, recycle-ability, air, water, waste, sound, ecological literacy, and management tools. CSU

Engineering 204
Building Automation & Controls

Unit(s): 3.0

Class Hours: 48 Lecture total.

In this course, students learn the basic principles of building automation and controls for energy management. Topics include control devices, signals, logic, and applications for various systems, such as electrical, lighting, HVAC, plumbing, fire protection, security, access control, voice-data-video, and elevator systems. CSU

Engineering 205
Engineering Programming and Problem-Solving

Unit(s): 3.0

Class Hours: 32 Lecture, 64 Laboratory total.

Prerequisite: Engineering 183 with a minimum grade of C.

This course includes fundamental studies of data handling and processing in engineering. It utilizes the MATLAB environment to provide students with a working knowledge of computer-based problem-solving methods relevant to science and engineering. It introduces the fundamentals of procedural and object-oriented programming, numerical analysis, and data structures. Examples and assignments in the course are drawn from practical applications in engineering, physics, and mathematics. CSU

Engineering 228
Descriptive Geometry

Unit(s): 3.0

Class Hours: 32 Lecture, 64 Laboratory total.

Application of the concepts of orthographic projection to the solution of three-dimensional problems arising in the various branches of engineering. Introductory computer aided drafting/design concepts or applications. Suggested preparation: Engineering 122 or 125. CSU/UC

Engineering 235
Statics

Unit(s): 3.0

Class Hours: 48 Lecture total.

Prerequisite: Physics 217 and Mathematic 185 with a minimum grade of C (Both classes can be taken concurrently).

A first course in engineering mechanics: properties of forces, moments, couples and resultants; two- and three-dimensional force systems acting on engineering structures in equilibrium; analysis of trusses, and beams; distributed forces, shear and bending moment diagrams, center of gravity, centroids, friction, and area and mass moments of inertia. Utilizes SI metrics. CSU/UC

Engineering 240 (C-ID ENGR 230)
Dynamics

Unit(s): 3.0

Class Hours: 48 Lecture total.

Prerequisite: Engineering 235 with a minimum grade of C.

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 motions of rigid bodies; work-energy and momentum principles for rigid body motion; Introduction to mechanical vibrations. CSU/UC

Engineering 250
Electric Circuits

Unit(s): 3.0

Class Hours: 48 Lecture total.

Prerequisite: Mathematics 280 and Physics 227 with a minimum grade of C (Both may be taken concurrently).

An introduction to the analysis of electrical circuits. Use of analytical techniques based on the application of circuit laws and network theorems. Analysis of DC and AC circuits containing resistors, capacitors, inductors, dependent sources, operational amplifiers, and/or switches. Natural and forced responses of first and second order RLC circuits; the use of phasors; AC power calculations; power transfer; and energy concepts. CSU/UC

Engineering 250L
Electric Circuits Laboratory

Unit(s): 1.0

Class Hours: 48 Laboratory total.

Prerequisite: Engineering 250 with a minimum grade of C or concurrent enrollment.

Selected laboratory exercises in engineering circuit analysis. Resistive, RL, RC, and RLC circuits and circuit analysis theorems. CSU/UC

Engineering 281
Properties of Engineering Materials

Unit(s): 3.0

Class Hours: 48 Lecture total.

Prerequisite: Chemistry 209 and Physics 217 with a minimum grade of C.

Study of atomic, microscopic, and macroscopic structure of metals; properties' enhancement by alloying and heat treatment; effects of temperature and corrosion on metals; fatigue; and other materials (wood, plastic, and concrete). CSU/UC