ENGINEERING

Associate Degrees

- Engineering - Associate in Arts
- Engineering - Associate in Science

ENGR 001 Technology and Society 3 Units
This course will explore the interrelationships between technology and the social sciences. Specifically, the course will investigate the societal factors which impact technology (historical, political, economic, ethical, and environmental) and the ways in which technology affects society (language, art, music, psychology, and sociology). This course is appropriate for students in both technical and non-technical majors.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: D IGETC: 4 District GE: D

ENGR 010 Introduction to Engineering 3 Units
This course provides an in-depth exploration of engineering disciplines, the diverse roles engineers play in various industries, and educational pathways. The course equips students with strategies to optimize their academic success, introduces problem-solving tools, and highlights the engineer's connection with society and ethical responsibilities. It also focuses on improving communication skills relevant to engineering professions. Additionally, the course offers a dynamic, hands-on exploration of engineering, emphasizing computer-aided problem-solving and design projects. It provides a holistic learning experience, encompassing both technical and non-technical skills, with a strong focus on teamwork and engineering problem analysis throughout the design process. (C-ID ENGR 110)

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: None IGETC: None District GE: None

ENGR 018 Engineering Design and Graphics 3 Units
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. (C-ID ENGR 150)

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L
Prerequisite: MATH 022 with C or better or placement by multiple measures
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: None IGETC: None District GE: None

ENGR 050 Introduction to Computing 4 Units
Students learn the fundamentals of computer-assisted problem solving, as it applies to the solution of engineering problems. The four major themes of this course are algorithm development, efficient programming/modeling, PC device interfacing, and practical and user-friendly pre/post-processing techniques. The C++ programming language is used to obtain solutions to various engineering problems. Object-oriented programming using subjects such as classes, pointers, inheritances, dynamic allocation of memory space, and standard template libraries are emphasized.

Lecture Hours: 3 Lab Hours: 3 Repeatable: No Grading: L
Prerequisite: MATH 066 or MATH 071 with C or better
Recommended: Ability to use word processing and spreadsheet software; completion of ENGR 010
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: None IGETC: None District GE: None

ENGR 061 Plane Surveying 3 Units
This course is designed for students majoring in civil engineering or construction management. It offers an extensive exploration of plane surveying, involving the application of theoretical principles and concepts, office computations, and the operation of surveying field equipment. The course also delves into the production of engineering plans and maps. Students will engage with various topics, including distance measurements, angle and direction calculations, differential leveling, traversing, property and boundary surveys, topographic surveys, volume and earthwork computations, analysis of horizontal and vertical curves, land description techniques, and the utilization of GPS technology. Throughout the course, students will gain hands-on experience through substantial fieldwork, where they will utilize tools such as tapes, levels, transits, theodolites, total stations, and GPS equipment to reinforce their practical skills and understanding of surveying techniques.

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L
Prerequisite: MATH 022 or MATH 025 with C or better
Recommended: ENGR 010 or ENGR 010A and ENGR 010L
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: None IGETC: None District GE: None

ENGR 066 Properties of Materials 3 Units
Mechanical, thermal, electrical, magnetic and chemical properties of materials are studied. The effect of atomic and crystal structure and various bonding mechanisms on the above properties are discussed. Diffusion and phase analysis in various materials, defects, and failure in materials including the effect of heat treatment on the strength of materials are also investigated. Various laboratory experiments such as impact, tensile and compression, torsion, fatigue, corrosion, thermal conduction and expansion, electrical conduction, magnetic strength, composite structure, rubber and polymer resilience, and photomicrograph are conducted to provide enhanced knowledge of material properties.

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L
Prerequisite: CHEM 001A and PHYS 004A or PHYS 007A, all with C or better
Recommended: ENGR 010 and ability to use word processing and spreadsheet software
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: None IGETC: None District GE: None

ENGR 069 Statics 3 Units
This course covers the equilibrium characteristics of various structures that are subject to external forces. The effects of various types of forces on the equilibrium of objects are discussed through the application of vector mechanics and the laws of Newton. Topics studied include two and three-dimensional rigid structures, free-body diagrams, the concept of centroids, distributed load analysis, moment of inertia analysis, friction, and virtual work. The structures considered are primarily trusses, machines, and frames.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
Prerequisite: PHYS 004A or PHYS 007A with C or better
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: None IGETC: None District GE: None

ENGR 071 Introduction to Circuit Analysis 4 Units
This course is fundamental for electrical engineering and computer engineering majors, as it lays the foundation for most upper-division coursework in these fields. It provides a comprehensive exploration of electrical circuits, emphasizing the application of circuit laws and network theorems through analytical techniques. The course encompasses the analysis of circuits containing various components, such as resistors, capacitors, inductors, and operational amplifiers, in both DC and AC scenarios. Topics covered include the natural and forced responses of RLC circuits, phasors, AC power calculations, power transfer, and energy concepts. Furthermore, students will gain exposure to the construction and measurement of electrical circuits, becoming proficient in using electrical testing and measurement instruments like multimeters, oscilloscopes, power supplies, and function generators. They will also learn to work with circuit simulation software and interpret both measured and simulated data based on circuit analysis principles, catering to DC, transient, and sinusoidal steady-state conditions. Practical aspects, including component value tolerance and non-ideal characteristics of laboratory instruments, will be addressed, along with the construction and measurement of basic operational amplifier circuits. (C-ID ENGR 260; ENGR 260L)

Lecture Hours: 3 Lab Hours: 3 Repeatable: No Grading: L
Prerequisite: MATH 078 and PHYS 007B both with C or better
Corequisite: MATH 078
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: None IGETC: None District GE: None