ENGINEERING

Ventura College offers a two-year lower-division engineering program that prepares students for transfer to colleges and universities in California and across the nation. The first two years of the engineering curriculum, at most colleges and universities, are similar with specialization commencing in the junior year. Completion of the lower division core courses listed is essential in facilitating progress as an upper division engineering transfer student. It is important that engineering students meet with an engineering transfer counselor and/or the Engineering Department for specific requirements for transfer.

ENGR V01 Introduction to Engineering 3 Units
Formerly: ENGR 1
In-Class Hours: 52.5 lecture
C-ID: ENGR 110
The course explores the branches of engineering, 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.
Grade Modes: Letter Graded
Field Trips: May be required
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

ENGR V02 Engineering Graphics and Design 3 Units
In-Class Hours: 35 lecture, 52.5 laboratory
Prerequisites: MATH V05 or high school equivalent with grade C or better
C-ID: ENGR 150
This course applies the principles of engineering drawing in visually communicating engineering designs and introduces computer-aided design (CAD). Topics include the development of visualization skills; orthographic projections; mechanical dimensioning and tolerancing practices; production of engineering drawings; and the engineering design process. The use of CAD software is an integral part of the course. Assignments develop sketching and 2-D and 3-D CAD skills.
Grade Modes: Letter Graded
Field Trips: May be required
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

ENGR V12 Engineering Statics 3 Units
In-Class Hours: 52.5 lecture
Prerequisites: MATH V21B and PHYS V04 and PHYS V04L
C-ID: ENGR 130
This is an initial course in engineering mechanics and will cover properties of forces, moments, couples, and resultants. Two- and three-dimensional force systems acting on engineering structures in equilibrium, analysis of trusses and beams, and distributed forces will be presented. Shear and bending moment diagrams, center of gravity, centroids, friction, and area and mass moments of inertia will also be covered. Optional additional topics include fluid statics, cables, Mohr's circle, and virtual work.
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

ENGR V14 MATLAB: Programming and Problem Solving 3 Units
In-Class Hours: 35 lecture, 52.5 laboratory
Prerequisites: MATH V21A
C-ID: ENGR 220
This course 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.
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

ENGR V16 Electronic Circuit Analysis 3 Units
Formerly: ENGR 16
In-Class Hours: 52.5 lecture
Prerequisites: MATH V23 or concurrent enrollment, and PHYS V05 and PHYS V05L
C-ID: ENGR 260
This course is an introduction to the analysis of electrical circuits. Use of analytical techniques based on the application of circuit laws and network theorems will be covered. Analysis of DC and AC circuits containing resistors, capacitors, inductors, dependent sources, operational amplifiers, and/or switches will also be presented. Natural and forced responses of first and second order RLC circuits, the use of phasors, AC power calculations, power transfer, and energy concepts will be discussed.
Grade Modes: Letter Graded
Field Trips: May be required
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

ENGR V16L Electronic Circuits Laboratory 1 Unit
Formerly: ENGR 16L
In-Class Hours: 52.5 laboratory
Prerequisites: ENGR V16 or concurrent enrollment
C-ID: ENGR 260L
This course is an introduction to the construction and measurement of electrical circuits. Basic use of electrical test and measurement instruments including multimeters, oscilloscopes, power supplies, and function generators is covered. Use of circuit simulation software is presented. Interpretation of measured and simulated data based on principles of circuit analysis for DC, transient, and sinusoidal steady-state (AC) conditions is covered, as well as elementary circuit design. Practical considerations, such as component value tolerance and non-ideal aspects of laboratory instruments, are explained. Construction and measurement of basic operational amplifier circuits is demonstrated.
Grade Modes: Letter Graded
Field Trips: May be required
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

ENGR V18 Engineering Materials 3 Units
In-Class Hours: 52.5 lecture
Prerequisites: CHEM V01A-V01AL and PHYS V04-V04L
Corequisites: ENGR V18L
C-ID: ENGR 140, ENGR 140B
This course presents the internal structures and resulting behaviors of materials used in engineering applications, including metals, ceramics, polymers, composites, and semiconductors. The emphasis is upon developing the ability both to select appropriate materials to meet engineering design criteria and to understand the effects of heat, stress, imperfections, and chemical environments upon material properties and performance.
Grade Modes: Letter Graded
Field Trips: May be required
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

ENGR V18L Engineering Materials Laboratory 1 Unit
In-Class Hours: 52.5 laboratory
Corequisites: ENGR V18
C-ID: ENGR 140L, ENGR 140B
This laboratory course is an experimental exploration of the connections between the structure of materials and materials properties. The laboratory provides the opportunity to directly observe the structures and behaviors discussed in the lecture course, ENGR V18, and to operate testing equipment, to analyze experimental data, and to prepare reports.
Grade Modes: Letter Graded
Field Trips: May be required
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

- Engineering, Associate in Science (http://catalog.vcccd.edu/ventura/programs-courses/engineering/engineering-as/)
- Physical Science: Engineering Technology, Associate in Science (http://catalog.vcccd.edu/ventura/programs-courses/engineering/physical-science-engineering-technology-as/)

- Engineering, Certificate of Achievement (http://catalog.vcccd.edu/ventura/programs-courses/engineering/engineering-coa/)
- Physical Science: Engineering Technology, Certificate of Achievement (http://catalog.vcccd.edu/ventura/programs-courses/engineering/physical-science-engineering-technology-coa/)