Engineers design the systems, structures and products that keep the world running. Engineers specialize in one of a wide range of fields such as electrical engineering, mechanical engineering, chemical engineering, materials engineering, industrial engineering, civil engineering, and more. Depending on specialization, engineers can find work in a wide range of different settings from a manufacturing plant in Silicon Valley or energy efficient construction project in San Francisco to road building in Africa, petroleum exploration in the North Sea, or design of new nanotechnology products at a national laboratory.

Laney College offers the lower division engineering major preparation courses for transfer in good standing to colleges and universities across California and the U.S. Engineering involves the application of scientific and mathematical principles to solve practical technical problems. In addition to the engineering courses, the preparation typically includes coursework in the sciences and mathematics, for example: Chemistry 1A and 1B (additional courses required for chemical Engineering), Physics 4A, 4B, and 4C, and Math 2A, 3A, 3B, 3C, 3E, and 3F. Because specific requirements vary among colleges and universities and between majors in different branches of engineering, students seeking transfer with an engineering major should consult with a Laney counselor to develop an appropriate Student Education Plan (SEP) and review CSU and UC engineering articulation agreements via the ASSIST website (www.assist.org) to ensure that all required courses for the major are completed.

**ENGIN 17**
**Introduction to Electrical Engineering**
3 units, 3 hours lecture (GR)
Prerequisite: Phys 4B
Prerequisite or corequisite: Math 3F or 3D
Acceptable for credit: CSU, UC
Introduction to electrical engineering: Basic circuit elements, modeling, critical laws and network theorems; techniques for analysis of lumped, linear circuits including operational amplifiers; analysis of AC circuits and power; semiconductor diodes and rectifier design. 0901.00

**ENGIN 22**
**Engineering Graphics**
3 units, 1 hour lecture, 6 hours laboratory (GR)
Acceptable for credit: CSU, UC
Fundamentals of engineering graphics: Technical drawings and design, description geometry, vector geometry, and graphical computation; CAD techniques used in solving problems. 0901.00

**ENGIN 35**
**Engineering Mechanics—Statics**
3 units, 3 hours lecture (GR)
Prerequisite: Math 3C and Phys 4A
Acceptable for credit: CSU, UC
Vectorial treatment of principles of the static of particles and rigid bodies: Applications to problem of two- and three-dimensional systems; centroids and moments of inertia, structures, friction, and principles of virtual work. 0901.00

**ENGIN 36**
3 units, 3 hours lecture (GR)
Prerequisite: Engin 35
Acceptable for credit: CSU, UC
Application of principles of statics to materials: Concepts of stress, strain, and material behavior used to analyze simple structural members under axial, bending, and torsional loadings; multi-axial treatment of stresses and strains, tensor transformations, yielding and failure. 0901.00

**ENGIN 45**
**Properties of Materials**
3 units, 2 hours lecture, 3 hours laboratory (GR)
Prerequisite: Chem 1A and Phys 4A
Recommended preparation: Engl 1A
Acceptable for credit: CSU, UC
Study of the properties of materials: Crystalline and non-crystalline structure and the microstructure that determines the thermodynamic, mechanical, electronic, magnetic, and environmental properties of metallic, ceramic, polymeric, composite, and electronic materials. 0901.00

**ENGIN 77**
**Computer Programming for Engineers Using MATLAB**
4 units, 3 hours lecture, 3 hours laboratory (GR)
Recommended preparation: Math 3A
Acceptable for credit: CSU, UC
Introduction to computer programming techniques and the use of MATLAB for solving computer-based engineering problems: Basic programming techniques including loops, conditionals, and procedural programming; data analysis and graphing; linear algebra and matrices, solutions to systems of linear equations; numerical integration and differentiation, graphic interpolations. 0901.00
AA / AS area 4c
**Engineering**

**ENGIN 100**  
**Earth Systems: Sustainability, Ecology and Environmental Justice for Technicians and Engineers**  
3 units, 3 hours lecture (GR or P/NP)  
Acceptable for credit: CSU, UC (pending)  
Introduction to earth’s ecological systems: The built environment and principles of sustainability with a focus on ecology, systems theory, the application of technology, and environmental justice. Investigation of green collar jobs in construction, renewable energy, and building performance fields. Designed for students of Architecture and Engineering Technology, Carpentry, Construction Management, Electricity/Electronics Technology, Engineering, and Environmental Control Technology. 0901.00  
AA/AS area 1, 2