

PHYSICAL SCIENCE & ENGINEERING

A.S. Degrees



The A.S. degree in Engineering and Physical Science has two options.

The **Physical Science and Engineering** option provides a broad background in the sciences. Students completing this degree will have learned to integrate math and science to solve problems, have proficiency in laboratory techniques and analysis of experimental data, and will have demonstrated an ability to communicate effectively using written, oral, electronic, and graphical means. This degree will prepare students interested in transferring to four-year colleges or universities to pursue degrees in any of the natural or physical sciences (astronomy, chemistry, geology or geophysics, general science, meteorology, oceanography, physics, etc). Students electing this major are encouraged to consult the catalogs of the four-year schools to which they plan to transfer early in their Gavilan course work as requirements for transfer vary by institution.

Engineers are responsible for designing and building everything that we use – airplanes, roads, machines, computers, buildings, artificial limbs.

The **Physical Science and Engineering: General Engineering** option constitutes the lower-division core classes suggested by the Engineering Liaison Council (ELC), an organization composed of representatives from two- and four-year colleges and universities. Students completing this degree will have learned to identify various engineering problems and integrate math and science to solve them, have proficiency in the design, execution, analysis, and interpretation of experiments, demonstrate familiarity with the engineering design process, and will have demonstrated an ability to communicate effectively using written, oral, electronic, and graphical means. This degree will prepare students to transfer to four-year colleges or universities to pursue degrees in any of the engineering disciplines (aeronautical, chemical, civil, computer, electrical, industrial, materials, mechanical, etc.). Students electing this major are encouraged to consult the catalogs of the four-year schools to which they plan to transfer early in their Gavilan course work as requirements for transfer vary by institution.

General Education Requirements: A student may complete the Gavilan College AA/AS general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 47-57 or see a counselor for details.

Please note that not all courses required for the degree are offered on a regular basis.

Contact:
(408) 848-4701
las@gavilan.edu

Physical Science and Engineering *A.S. Degree*

CHEM 1A/B	General Chemistry	5-5	units
MATH 1A/B	Single-Variable Calculus & Analytic Geometry	4-4	units
MATH 1C	Multivariable Calculus	4	units
MATH 2*	Linear Algebra	3	units
MATH 2C	Differential Equations	3	units
ENGR 5	C++ Scientific Programming	3	units
PHYS 4ABC	Physics for Scientists and Engineers	4-4-4	units
		43	units

Plus completion of general education requirements: units vary
 Total Units Required: minimum of 60 UNITS

* There are times when a course listed as a requirement for a major or certificate cannot be offered in a reasonable timeframe. Course substitutions and waivers will be considered by the department. Please contact the department chairperson. This information is available from the Office of Instruction - (408) 848-4761

Program Learning Outcomes: After completing this degree a student will be able to:

- ▶ demonstrate appropriate integration of math and science to solve real-world problems.
- ▶ demonstrate appropriate design and execution of experiments, as well as analysis and interpretation of the data.
- ▶ demonstrate an ability to communicate clearly using written, oral, electronic, and graphical means.

Students are strongly advised to consult the appropriate college catalogs and their counselors to determine the specific lower division requirements if you are transferring to a 4-year institution.

NOTE: A course may be used to satisfy both general education and major courses. See "Double Counting Rule" on page 41.

Physical Science and Engineering: General Engineering *A.S. Degree*

CHEM 1A/B	General Chemistry	5-5	units
ENGL 1A	Composition	3	units
ENGR 1	Engineering Graphics	3	units
ENGR 2	Statics	3	units
ENGR 3	Electrical Circuits, Devices and Systems	3	units
ENGR 4	Properties of Materials	3	units
ENGR 5	C++ Scientific Programming	3	units
MATH 1A/B	Single-Variable Calculus & Analytic Geometry	4-4	units
MATH 1C	Multivariable Calculus	4	units
MATH 2*	Linear Algebra	3	units
MATH 2C	Differential Equations	3	units
PHYS 4ABC	Physics for Scientists and Engineers	4-4-4	units
		58	UNITS

Plus completion of general education requirements: units vary
 Total Units Required: minimum of 60 UNITS

* There are times when a course listed as a requirement for a major or certificate cannot be offered in a reasonable timeframe. Course substitutions and waivers will be considered by the department. Please contact the department chairperson. This information is available from the Office of Instruction - (408) 848-4761

Program Learning Outcomes: After completing this degree a student will be able to:

- ▶ identify, compare and contrast engineering problems and demonstrate integration of math and science to solve them.
- ▶ demonstrate appropriate design and execution of experiments, as well as analyze and interpret of the data.
- ▶ demonstrate the engineering design process by designing a system, component or process to meet a desired need.
- ▶ demonstrate an ability to communicate clearly using written, oral, electronic and graphical means.

Students are strongly advised to consult the appropriate college catalogs and their counselors to determine the specific lower division requirements if you are transferring to a 4-year institution.

NOTE: A course may be used to satisfy both general education and major courses. See "Double Counting Rule" on page 41.