

# ENGINEERING (SUMMER AND FALL)

The following program requirements apply only to Summer Session 2023 and Fall Quarter 2023. For current requirements, effective Winter Quarter 2024, refer to the [Engineering listing](#). If you have any questions, please meet with a Foothill counselor.

## Program Description

Engineers apply the theories and principles of science and mathematics to practical technical problems. The engineering major provides a solid foundation in what is normally referred to as the "engineering core" at most colleges and universities. Mathematics, physics, chemistry, and introductory engineering courses such as circuit analysis and statics make up the bulk of this core. The major is intended to provide, in most cases, all of the basic subjects necessary for a smooth transfer to the candidate's chosen college or university.

Learn more about the program on the [Engineering website](#).

## Program Learning Outcomes

- Students will be able to formulate logical problem-solving approaches, generate solutions, and assess the reasonableness of the solutions for engineering-type analysis problems.
- Students will be able to design, construct, and produce creative solutions to engineering problems by applying the engineering design process and identifying pertinent design parameters based on the fundamental physics governing a system.
- Students will be able to demonstrate understanding of the fundamental knowledge necessary for the practice of, or for advanced study in, engineering, including scientific principles, rigorous analysis, and problem solving.
- Students will be able to demonstrate clear communication skills, responsible teamwork, professional attitudes, and ethics.
- Students will be able to demonstrate a preparation for the complex work environment and continuous learning.

## Career Opportunities

Engineering continues to be an excellent choice for a career. Engineering consistently has low rates of unemployment. Salaries at the entry level begin at about \$50,000 with an Associate in Science degree and may go as high as \$170,000 for a Bachelor in Science degree in particular specializations.

## Award Type(s)

- AS = Associate in Science Degree

## Units Required

- Major: 68

## Additional Information

### Suggested Preparation Courses:

Code	Title	Units
MATH 1A	CALCULUS (or equivalent)	5
MATH 48C	PRECALCULUS III (or equivalent)	5

CHEM 25	FUNDAMENTALS OF CHEMISTRY (or equivalent)	5
PHYS 2A	GENERAL PHYSICS	5
or PHYS 6	INTRODUCTORY PHYSICS	
	or equivalent	

**Note:** Students should check with the transfer institution for any additional required courses.

## Associate Degree Requirements

Code	Title	Units
<b>English Proficiency</b>		
Select one of the following:		
ENGL 1A	COMPOSITION & READING	5
ENGL 1AH	HONORS COMPOSITION & READING	5
ESLL 26	ADVANCED COMPOSITION & READING	5
	or equivalent	
<b>Mathematics Proficiency</b>		
College-level math course at or above the level of Intermediate Algebra		

A minimum of 90 units is required<sup>1</sup> to include:

- Completion of one of the following general education patterns: Foothill General Education, CSU General Education Breadth Requirements or the Intersegmental General Education Transfer Curriculum (IGETC)
- Core courses (53 units)
- Support courses (15 units)

<sup>1</sup> Additional elective course work may be necessary to meet the 90-unit minimum requirement for the associate degree.

**Note:** All courses pertaining to the major must be taken for a letter grade. In addition, a grade of "C" or better is required for all core and support courses used for the degree.

## Core and Support Courses

Code	Title	Units
<b>Core Courses</b>		
CHEM 1A	GENERAL CHEMISTRY	5
CHEM 1B	GENERAL CHEMISTRY	5
ENGR 10	INTRODUCTION TO ENGINEERING	5
MATH 1B	CALCULUS	5
	or MATH 1BH HONORS CALCULUS II	
MATH 1C	CALCULUS	5
MATH 1D	CALCULUS	5
MATH 2A	DIFFERENTIAL EQUATIONS	5
PHYS 4A	GENERAL PHYSICS (CALCULUS)	6
PHYS 4B	GENERAL PHYSICS (CALCULUS)	6
PHYS 4C	GENERAL PHYSICS (CALCULUS)	6
<b>Support Courses</b>		
Select 15 units from the following:		15
C S 1A	OBJECT-ORIENTED PROGRAMMING METHODOLOGIES IN JAVA	
C S 2A	OBJECT-ORIENTED PROGRAMMING METHODOLOGIES IN C++	

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C S 3A	OBJECT-ORIENTED PROGRAMMING METHODOLOGIES IN PYTHON
C S 10	COMPUTER ARCHITECTURE & ORGANIZATION
ENGR 6	ENGINEERING GRAPHICS
ENGR 11	PROGRAMMING & PROBLEM-SOLVING IN MATLAB
ENGR 28 or BIOL 28	INTRODUCTION TO BIOENGINEERING INTRODUCTION TO BIOENGINEERING
ENGR 35	STATICS
ENGR 37	INTRODUCTION TO CIRCUIT ANALYSIS
ENGR 45	PROPERTIES OF MATERIALS
ENGR 47	DYNAMICS
MATH 2B	LINEAR ALGEBRA
PHYS 4D	GENERAL PHYSICS (CALCULUS)
<b>Total Units</b>	<b>68</b>