

**Major Required 65 units**

BIO1110 - Life Science (2) (B2)  
 BIO1110L - Life Science Laboratory (1) (B3)  
 CS1300 - Discrete Structures (3)  
 CS1400 - Introduction to Programming and Problem Solving (4)  
 CS2400 - Data Structures and Advanced Programming (4)  
 CS2600 - Systems Programming (3)  
 CS2640 - Computer Organization and Assembly Programming (3)  
 CS3010 - Numerical Methods (3)  
 CS3110 - Formal Languages and Automata (3)  
 CS3310 - Design and Analysis of Algorithms (4)  
 CS3560 - Object-Oriented Design and Programming (3)  
 CS3650 - Computer Architecture (4)  
 CS3750 - Computers and Society (3) (B5 or D4)  
 CS4080 - Concepts of Programming Languages (3)  
 CS4310 - Operating Systems (3)  
 CS4630 - Undergraduate Seminar (1)  
 CS4800 - Software Engineering (3)  
 MAT1140 - Calculus I (4) (B4)  
 MAT1150 - Calculus II (4) (B4)  
 PHY1510 - Introduction to Newtonian Mechanics (3) (B1)  
 PHY1510L - Newtonian Mechanics Laboratory (1) (B3)  
 STA2260 - Probability and Statistics for Computer Scientists and Engineers (3)

**Major Electives 19 units**
**At least 12 units from:**

CS3520 - Symbolic Programming (3)  
 CS3700 - Parallel Processing (3)  
 CS3800 - Computer Networks (3)  
 CS4110 - Compilers and Interpreters (3)  
 CS4200 - Artificial Intelligence (3)  
 CS4210 - Machine Learning and Its Applications (3)  
 CS4250 - Web Search and Recommender Systems (3)  
 CS4350 - Database Systems (3)  
 CS4450 - Computer Graphics (3)  
 CS4500 - Computability (3)  
 CS4600 - Cryptography and Information Security (3)  
 CS4650 - Big Data Analytics and Cloud Computing (3)  
 CS4700 - Game Development (3)  
 CS4750 - Mobile Application Development (3)  
 CS4810 - Software Engineering Practice (3)  
 CS4990 - Special Topics for Upper Division Students (1-3)

**No more than 5 units from:**

CS2450 - Programming Graphical User Interfaces (3)  
 CS2520 - Python for Programmers (3)  
 CS2560 - C++ Programming (3)  
 CS2990 - Special Topics for Lower Division Students (1-3)

**No more than 2 units from:**

CS2000 - Special Study for Lower Division Students (1-3)  
 CS4000 - Special Study for Upper Division Students (1-3)  
 CS4410 - Internship in Computer Science (1-2)  
 CS4610 - Senior Project (1)  
 CS4620 - Senior Project (1)

**General Education Requirements 48 Units**

Students should consult the Academic Programs website

<https://www.cpp.edu/~academic-programs/general-education-course-listings.shtml>

for current information regarding this requirement. Unless specific courses are required, please refer to the list of approved courses under General Education Requirements, Areas A through E.

**Area A. English Language Communication and Critical Thinking (9 units)**

At least 3 units from each sub-area

1. Oral Communication
2. Written Communication
3. Critical Thinking

**Area B. Scientific Inquiry and Quantitative Reasoning (12 units)**

At least 3 units from B1, B2, B4, and B5 including 1 unit of lab from B1 or B2 to fulfill B3

1. Physical Sciences
2. Life Sciences
3. Laboratory Activity
4. Mathematics/Quantitative Reasoning
5. Science and Technology Synthesis

**Area C. Arts and Humanities (12 units)**

At least 3 units from each sub-area and 3 additional units from sub-areas 1 and/or 2

1. Visual and Performing Arts
2. Literature, Modern Languages, Philosophy and Civilization
3. Arts and Humanities Synthesis

**Area D. Social Sciences (12 units)**

At least 3 units from each sub-area

1. U.S. History and American Ideals
2. U.S. Constitution and California Government
3. Social Sciences: Principles, Methodologies, Value Systems, and Ethics
4. Social Science Synthesis

**Area E. Lifelong Learning and Self-Development (3 units)**
**Interdisciplinary General Education 21 Units**

An alternate pattern for partial fulfillment of GE Areas A, C, and D available for students is the Interdisciplinary General Education (IGE) program. Students should see an advisor for specific GE coursework required by their major. Please refer to the University Catalog General Education Program section for additional information.

**How IGE fulfills General Education Requirements:**

Year	Completion of IGE Courses	Satisfies GE Requirements
First	IGE 1100, IGE 1200	A2 and C2
Second/Third	IGE 2100, IGE 2200	C1 and C2
	IGE 2300, IGE 2400	D1 and D3
Third/Fourth	IGE 3100	C3 or D4

**American Institutions 6 Units**

Courses that satisfy this requirement may also satisfy GE Area D1 and D2.

**American Cultural Perspectives Requirement 3 Units**

Refer to the University Catalog General Education Program section for a list of courses that satisfy this requirement. Course may also satisfy major, minor, GE, or unrestricted elective requirements.

**Graduation Writing Test**

All persons who receive undergraduate degrees from Cal Poly Pomona must pass the Graduation Writing Test (GWT). The test must be taken by the semester following completion of 60 units for undergraduates.