

**Major Course Requirements**

A minimum of 93 hours (48 upper-division hours)

► **Required Core Courses (60 hours):**

CHEM 111+12+13	General Chemistry I,II,III	5+5+5
CHEM 225	Chemical Modeling	2
CHEM 324+L	Analytical Chemistry I+Lab	2+1
CHEM 325+L	Analytical Chemistry II+Lab	2+1
CHEM 326+L	Analytical Chemistry III+Lab	2+1
CHEM 371+72+73	Organic Chemistry I,II,III	4+4+4
CHEM 396	Science Seminar	.5
CHEM 397	Chemistry Seminar	.5
CHEM 414	Inorganic Chemistry	3
CHEM 450L	Physical Chemistry Lab	1
CHEM 451	Thermodynamics	4
CHEM 452	Kinetics	2
CHEM 461	Quantum Mechanics I	3
CHEM 481	Biochemistry I	4
CHEM 490+L	Senior Capstone+Lab	1+1
CHEM 499	Independent Research (x2)	1+1

► **Required Core Electives (5 hours):**

At least 5 hours of additional upper-division CHEM courses 5

► **Required Cognate Courses (28 hours):**

MATH 131+132	Calculus I,II	4+4
The following sequence:		12
PHYS 111+12+13	General Physics I,II,III (4+4+4)	
At least two of the following courses:		8-9
INFS 115	Introduction to Programming (4)	
MATH 265	Elementary Linear Algebra (4)	
MATH 267	Multivariable Calculus (5)	
MATH 269	Elementary Differential Equations (4)	
MATH 375	Numerical Analysis (4)	

**Student Learning Outcomes****Students can:**

- Apply quantitative or qualitative theories of molecular behavior to chemical problems.
- Be able to synthesize, purify, characterize, and analyze substances.
- Be skilled in accessing and utilizing chemical data and in communicating it orally and in writing.

**Occupational Information****What can I do with this major?**

Graduates with a bachelor's degree in chemistry have the necessary skills for entry-level employment as chemists in quality control, environmental, forensic, and research laboratories in private, industrial and government settings. They may also apply their degree in science-related jobs in sales, marketing, and middle management. Opportunities in the educational sector include employment in informal education arenas such as museums and content preparation for secondary teaching. The bachelor's degree in chemistry prepares the graduate for entry into professional and graduate schools.

**Additional Education Required?**

Some chemists with a bachelor's degree will seek to continue their education in graduate school to pursue advanced degrees leading to careers in chemical research, industry, forensic chemistry, patent law, scientific writing and secondary and college teaching.

Some graduates will use their bachelor's degree as a stepping stone to pursue professional education in preparation for careers in health professions such as dentistry, medicine, optometry, pharmacy, and veterinary medicine.

**Job Outlook**

Employment of chemists and materials scientists is expected to grow by 6% in the decade 2012-2022. This is a little slower than the average for all occupations. Greater than average growth will be likely for chemists working in environmental and biochemical areas. Job prospects for secondary science teachers appear good for the next decade.

*Median salaries for chemists, 2012:*

	B.S.	M.S.	Ph.D.
Industry	\$76,700	\$93,500	\$121,100
Government	\$74,039	\$83,785	\$112,320
Academia	\$42,000	\$53,000	\$73,000

**General Education Requirements**

To view general education requirements for this major, please refer to page A-01, Summary of General Education Requirements: B.S. Degree.

**How to Construct Your Own Program**

1. Consult with your academic advisor.
2. Consider your aptitudes, interests, and available courses.
3. Schedule major courses and cognates first.
4. Fill the rest of your schedule with G.E. requirements.
5. For the freshman year include English, Religion, and PE courses. Also include Basic Algebra I+II unless waived by previous work.

**What the Degree Includes**

- A total of 192 quarter hours including:
1. A minimum of 60 upper division hours.
  2. General Education requirements.
  3. Major requirements.
  4. Minimum 2.0 GPA, overall and major.

**For More Information**

Chemistry Department  
 Pacific Union College  
 One Angwin Avenue  
 Angwin, CA 94508  
 707-965-7600

Website: [www.puc.edu/chemistry](http://www.puc.edu/chemistry)

**Sample Four-Year Program**

This sample curriculum is designed to show you how a program may be constructed and to help you select a proper sequence of courses in the major. It is not likely that these courses can always be taken in the order given. Your advisor will help you design a personalized program of studies.

<b>First Year</b>	<b>F</b>	<b>W</b>	<b>S</b>
General Chemistry I,II,III	5	5	5
Calculus I,II	4	4	-
College English I,II	4	4	-
Religion Courses	-	3	3
General Education/Electives	3	-	9
	16	16	16

<b>Second Year</b>	<b>F</b>	<b>W</b>	<b>S</b>
Organic Chemistry I,II,III	4	4	4
Chemical Modeling	-	-	2
Analytical Chemistry I+Lab	3	-	-
General Physics I,II,III	4	4	4
Elementary Linear Algebra	4	-	-
General Education/Electives	1	8	6
	16	16	16

<b>Third and Fourth Years</b>	<b>F</b>	<b>W</b>	<b>S</b>
Thermodynamics	4	-	-
Biochemistry	4	-	-
Physical Chemistry Lab	1	-	-
Kinetics	-	2	-
Analytical Chemistry II+Lab	-	3	-
Analytical Chemistry III+Lab	-	-	3
Quantum Mechanics I	-	-	3
Inorganic Chemistry	-	-	3
Intro to Research	1	1	1
Chemistry Elective	6	3	3
Seminar	-	.5	.5
Capstone	-	-	2
Senior Assessment Seminar	-	-	.2
General Education/Electives	16	23	17
	32	32.5	32.7