

### Major Course Requirements

A minimum of 82 hours (29.5 upper-division hours)

► **Required Core Courses (69 hours):**

BIOL 112+111+113	Biological Foundations II,I,III	5+5+5
BIOL 222	Introduction to Research Methods II	2
CHEM 111+L	General Chemistry I+Lab	4+1
CHEM 112+L	General Chemistry II+Lab	4+1
CHEM 113+L	General Chemistry III+Lab	4+1
INFS 115	Intro to Computer Programming	4
MATH 131+132	Calculus I,II	4+4
MATH 265	Elementary Linear Algebra	4
MATH 269	Elementary Differential Equations	4
MATH 290	Sophomore Seminar	.5
MATH 310	Foundational Math for Modeling	4
MATH 385	Mathematical Modeling	4
MATH 390	Junior Seminar	.5
MATH 462+L	Bioinformatics+Lab	4
MATH 490	Senior Seminar	1
STAT 322	Statistical Methods	3

► **Required Core Electives (13 hours):**

At least 13 hours from the following courses: 17  
 (Include at least 4 hours of DTSC or MATH and two BIOL courses)

BIOL 320	Cell and Molecular Biology (4)
BIOL 328	Animal Behavior (4)
BIOL 331	Marine Science (4)
BIOL 338	Field Biology (3)
BIOL 348	Systems Physiology (5)
BIOL 354	Genetics (4)
BIOL 430	Neuroscience (4)
BIOL 469	Immunology (4)
CHEM 371+L	Organic Chemistry I+Lab (3+1)
CHEM 372+L	Organic Chemistry II+Lab (3+1)
DTSC 323L	Statistical Methods in Data Sci Lab (1)
DTSC 420	Machine Learning (3)
DTSC 425	Legal and Ethical Aspects of Data (2)
MATH 350	Overview of Abstract Algebra (4)
MATH 423	Overview of Real Analysis (4)

**Recommended Cognate Courses:**

CHEM 373	Organic Chemistry III (4)
CHEM 481	Biochemistry I (4)
PHYS 111+12+13	General Physics I,II,III (4+4+4)

*Note: Many of the required and elective courses for this major carry pre-requisites; consult with the major advisor to select and sequence all courses.*

### Student Learning Outcomes

**Students can:**

- Demonstrate proficiency in the basic problem-solving skills and problem-solving methods of calculus, elementary linear algebra, elementary differential equations, and statistics.
- Demonstrate basic competence with the concepts and constructs of general chemistry and biology.
- Apply mathematical methods in the modeling of various biological phenomena.
- Communicate modeling methods and results in appropriate written and oral form to peers as well as to people with less scientific and mathematical background.
- Perform as an effective member of a mathematical modeling team.
- Display familiarity with various technologies commonly used for mathematical investigations.

### Occupational Information

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

The Biomathematics major is an attractive way to prepare for medical school or dental school. The major provides excellent preparation for graduate study leading to a Master's Degree in Public Health with emphasis in Biostatistics. A growing area of biological research uses sophisticated mathematics to study genetics, population fluctuations, and metabolic functions. This major provides entry to such graduate programs as Biomathematics, Biostatistics, Mathematical Biology, and Biometrics.

**Additional Education Required?**

The normal career paths leading from a Bachelor's degree with a major in Biomathematics all require an advanced degree.

**Public Sector vs. Denominational**

The fields of health and medicine, as well as teaching, provide numerous opportunities in the public sector and within the denomination.

**Job Outlook**

Health care jobs such as medicine and dentistry continue to show a high demand. Biostatisticians should experience employment growth, primarily because of the growing pharmaceuticals business. As pharmaceutical companies develop new treatments and medical technologies, biostatisticians will be needed to do research and clinical trials.

### 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. Counsel with your 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

Mathematics and Physics Department  
 Pacific Union College  
 One Angwin Avenue  
 Angwin, CA 94508  
 (707) 965-7269

E-mail: [biomath@puc.edu](mailto:biomath@puc.edu)  
 Website: [www.puc.edu/mathematics](http://www.puc.edu/mathematics)

### 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>F</b>	<b>W</b>	<b>S</b>
<b>First Year</b>			
Essential Algebra & Trig for Scientists	2	-	-
Calculus I,II	-	4	4
General Chemistry I,II,III	5	5	5
College English I,II	4	4	-
Religion Courses	3	3	3
Introduction to Statistics	-	-	4
General Education/Electives	2	-	-
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	16	16	16
<b>Second Year</b>			
Biological Foundations II,I,III	5	5	5
Organic Chemistry I,II,III	4	4	4
Elementary Linear Algebra (odd)*	4	-	-
Statistical Methods	-	3	-
Intro to Computer Programming	-	-	4
Sophomore Seminar	-	.5	-
Religion Course	-	-	3
General Education/Electives	3	4	-
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	16	16.5	16
<b>Third and Fourth Years</b>			
Elementary Differential Equations (even)*	4	-	-
Foundational Math for Modeling (even)*	-	4	-
Introduction to Research Methods II	-	-	2
Mathematical Modeling (even)*	-	-	4
Bioinformatics+Lab (odd)*	-	-	4
Junior Seminar	-	-	.5
Senior Seminar	-	-	1
Math Elective	-	4	-
Biology Electives	5	4	4
Upper-Division Religion Courses	3	3	3
Senior Assessment Seminar	-	-	.2
General Education/Electives	20	17	14
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	32	32	32.7

\* Courses marked (even) or (odd) are taught in alternate years only. 2023-2024 is even, 2024-2025 is odd.