

Major Course Requirements

A minimum of 106 hours (39 upper-division hours)

> Required Core Courses (96 hours)

| | | |
|------------------|---------------------------------|-------|
| BIOL 11+112+113 | Biological Foundations I,II,III | 5+5+5 |
| BIOL 320 | Cellular and Molecular Biology | 4 |
| BIOL 348 | Systems Physiology | 5 |
| CHEM 111+112+113 | General Chemistry I,II,III | 5+5+5 |
| CHEM 371+372+373 | Organic Chemistry I,II,III | 4+4+4 |
| CHEM 481 | Biochemistry I | 4 |
| ENGR 216 | Circuit Analysis | 4 |
| MATH 131+132 | Calculus I,II | 4+4 |
| MATH 267 | Multivariable Calculus | 5 |
| PHYS 314 | Elementary Modern Physics | 4 |
| PHYS 321 | Biophysics | 3 |
| PHYS 322 | Medical Physics | 3 |
| PHYS 389L | Experimental Physics | 1 |
| PHYS 489L | Advanced Experimental Physics | 1 |

At least one of the following options: 12-16

PHYS 211+212+213 Physics with Calculus I,II,III (12)

or

PHYS 111+112+113+265 General Physics + Applied Physics (16)

> Required Core Electives (10 hours)

At least 10 hours from the following: 10

(Including at least 2 upper-division hours)

In consultation with the advisor, select additional non-service BIOL and PHYS courses. CHEM 450L, CHEM 451, and CHEM 452 may also apply.

Recommended Courses:

| | |
|----------|-----------------------------------|
| INFS 115 | Intro to Computer Programming (4) |
| MICR 134 | General Microbiology (5) |

Student Learning Outcomes

Students can:

- Demonstrate proficiency in the fundamentals of applied physics and Biology (Applied Optics, Modern Physics, Circuit Theory, Biophysics).
- Identify career options appropriate to their degree program, both within Physics and Biology careers (especially medical school).
- Demonstrate the ability to effectively communicate scientific information and concepts in both written and verbal form.
- Apply physical principles to novel situations, both in the classroom and in laboratory settings, through critical thinking, problem solving, mathematical and computer modeling, and laboratory experimentation.
- Construct and assemble experimental apparatuses, conduct and analyze measurements of physical phenomena, assess experimental uncertainty, and make meaningful comparisons between experiment and theory.

Occupational Information

What can I do with this major?

The biophysics major provides a footing-track to pre-professional schools such as medical, dental, and pharmacy schools. Additionally, the major provides an excellent preparation for graduate training in biophysics, physiology, radiation-biology, and environmental science. With additional professional education courses this broad exposure to physics, biology, chemistry, and mathematics qualifies the biophysics major for teaching at the secondary level.

Additional Education Required?

This program is intended as a preparation for graduate study in a university or professional school rather than an entry-level degree to employment.

Public Sector vs. Denominational, Job Outlook

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

Undergraduate Research Opportunities

Since 2008, PUC students have participated in world-class physics research, most of which has been funded through NASA's APRA contracts and National Science Foundation grants. As a result, students have traveled to many national laboratories and international conferences; some are currently in the process of publishing the results of their research in peer-reviewed journals.

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

Physics & Engineering Department
 Pacific Union College
 One Angwin Avenue
 Angwin, CA 94508
 (707) 965-6592

E-mail: biophysics@puc.edu
 Website: www.puc.edu/physics

American Institute of Physics: www.aip.org

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.

| | F | W | S |
|---------------------------------|----------|----------|----------|
| First Year | | | |
| Computer Programming | 4 | - | - |
| General Chemistry I,II,III | 5 | 5 | 5 |
| Calculus I,II | 4 | 4 | - |
| College English I,II | - | 4 | 4 |
| General Education/Electives | 3 | 3 | 7 |
| | 16 | 16 | 16 |
| Second Year | | | |
| Physics with Calculus I,II,III | 4 | 4 | 4 |
| Biological Foundations I,II,III | 5 | 5 | 5 |
| Organic Chemistry I,II,III | 4 | 4 | 4 |
| General Education/Electives | 3 | 3 | 3 |
| | 16 | 16 | 16 |
| Third and Fourth Years | | | |
| Multivariable Calculus | 5 | - | - |
| Elementary Modern Physics | 4 | - | - |
| Circuit Analysis | - | - | 4 |
| Cell & Molecular Biology | - | 4 | - |
| Biochemistry I | 4 | - | - |
| Biophysics (even)* | - | 3 | - |
| Medical Physics (even) | - | - | 3 |
| Systems Physiology | 5 | - | - |
| Major Electives | 4 | 3 | 3 |
| Experimental Physics | - | 1 | - |
| Advanced Experimental Physics | - | - | 1 |
| Senior Assessment Seminar | - | - | .2 |
| General Education/Electives | 10 | 21 | 21 |
| | 32 | 32 | 32.2 |

* Courses marked (even) or (odd) are taught in alternate years only.
 2018-2019 is odd, 2019-2020 is even.