

# Pacific Union College

## Major in Natural Science—B.S.

### MAJOR COURSE REQUIREMENTS

**Major in Natural Science—B.S.** The major consists of the core requirements plus one emphasis as listed below.

**Require Core Courses:** (65 quarter units)

ASTR 115	Astronomy	5
ASTR 173	Meteorology	1
BIOL 111-2-3	Biological Foundations	5-5-5
BIOL 331	Marine Science	4
BIOL 345	Environmental Science	3
BIOL 450	Philosophy of Origins	3
CHEM 111-2-3	General Chemistry	5-5-5
GSCI 345	Environmental Science	3
GEOL 233	Geology	4
PHYS 111-2-3	General Physics	4-4-4
<i>(or PHYS 211-12-13. Required of students taking a Physics emphasis.)</i>		
PHYS 390	History and Philosophy of Science	3

**Emphasis: Choose one of the following emphases:**

**1. Biology Emphasis** (35-36 quarter units in biology plus 8 in chemistry cognates)

BIOL 233	Principles of Ecology	4
BIOL 320	Cell and Molecular Biology	4
BIOL 348	Systems Physiology	5
<i>(or BIOL 102 Human Physiology)</i>		
BIOL 354	Genetics	4
BIOL 396	Seminar (4 quarters)	2
MICR 134	General Microbiology	5

*One of the following courses:*

BIOL 328	Animal Behavior (4)	3
BIOL 323	Vertebrate Biology (4)	
BIOL 325	Flowering Plants (3)	

*Required Cognate Courses for the Biology Emphasis:*

CHEM 102	Survey of Organic Chemistry	4
CHEM 103	Survey of Biochemistry	4

**2. Chemistry Emphasis** (33 quarter units in chemistry plus 8 in mathematics cognates)

CHEM 324	Analytical Chemistry	3
CHEM 324L	Analytical Chemistry Laboratory	2
CHEM 451	Physical Chemistry	3
CHEM 371-2-3	Organic Chemistry	4-4-4
CHEM 373L	Advanced Organic Chemistry Lab	1
CHEM 381	Biochemistry	3

*Required Cognate Course for the Chemistry Emphasis:*

MATH 131-132	Calculus I-II	4-4
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**3. Physics Emphasis** (32 quarter units)

MATH 131-2-3	Calculus I-II-III	4-4-4
PHYS 314	Elementary Modern Physics	4

*And one of the following:*

ENGR 216	Circuit Theory (4)
PHYS 256	Applied Optics (4)

*Choose 12 upper division units from the following:* 12

CHEM 344	Nuclear Physics and Chemistry (3)
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*Upper division PHYS courses*

Note: For the physics emphasis, students must choose PHYS 211-212-213 in the core.

**Teaching Credential:**

The Natural Science major is designed to meet the requirements of the California secondary teaching credential in biology, chemistry, and physics. Students who plan to teach at the secondary level should consult the Credential Analyst in the Education Department and should become acquainted with specific requirements as outlined in Education section of the catalog.

### INFORMATION ABOUT THIS DEGREE

**General Areas of Service:**

High school teaching in science.

**Additional Professional Training:**

Additional study in professional education is needed to obtain a teaching credential.

**Denominational Opportunities:** Secondary-level teaching in the United States and overseas.

**Job Outlook:** Good.

**Earnings:** \$25,000 to \$40,000

**Footnotes:** \*This major fulfills the following general education requirements:

1. Philosophy: PHYS 390
2. Introductory-level mathematics and science
3. The Natural World: BIOL-PHYS-CHEM courses
4. Two hours of religion: PHYS 485

### FOR MORE INFORMATION:

Department of Physics  
Pacific Union College  
One Angwin Avenue  
Angwin, CA 94508

Department of Physics (707) 965-6684  
Department of Biology (707) 965-6633  
Department of Chemistry (707) 965-7597

## SUMMARY OF GENERAL EDUCATION

*Note: The following is a brief summary of General Education requirements. For a full explanation, please refer to the Pacific Union College Catalog.*

### Foundations of Learning

ENGL 101-102 College English (4-4)  
 Speech course: To be chosen from list (3)  
 STAT 222 Introduction to Statistics (4)

### Human Identity in Cultural Contexts

HIST 101-102 History of World Civilizations  
*or HIST 134-135 (4-4)*  
 Philosophy course: Fulfilled by PHYS 390  
 Two social sciences courses: To be chosen from list (7)

### Insights of the Imagination

Literature: ENGL 301 Great Books (4)  
 Art history course: To be chosen from list (3)  
 Music history course: To be chosen from list (3)

### The Natural World: Introductory-level

Fulfilled by the major

### The Natural World: College-level

Scientific Inquiry: Fulfilled by major  
 Laboratory science course: Fulfilled by major  
 Science, Technology, and Culture: Fulfilled by BIOL 450

### Revelation, Belief, and Action

Sixteen to eighteen quarter hours distributed as follows:  
 Minimum: 6 hours of courses with RELB prefixes  
 Maximum: 9 hours of lower division will apply  
 (Two hours fulfilled by the major if PHIL 485 is chosen)  
*For transfer students from public colleges, this requirement is prorated: Sophomores—14, Juniors—10, Seniors—6*

### Health and Fitness

One health course: To be chosen from list (2)  
 Four ESAC courses including one aerobics (4)  
 Transfer students: One for each year in residence at PUC

### Skills for Daily Living

Select 4 units from 2 or more categories. To be chosen from list (4)

### 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.

## 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.*

First and Second Years	A	W	S
General Chemistry	5	5	5
College English	-	4	4
Astronomy	-	4	-
Meteorology	1	-	-
Biological Foundation	5	5	5
General Physics*	4	4	4
Emphasis, General Education, Credentials and Electives	<u>17</u> 32	<u>10</u> 32	<u>14</u> 32
Third and Fourth Years	A	W	S
Geology	-	-	4
Environmental Science	3	-	-
Marine Science	4	-	-
Philosophy of Origins	-	4	-
History and Philosophy of Science	-	-	3
Emphasis, General Education, Credentials and Electives	<u>25</u> 32	<u>28</u> 32	<u>25</u> 32

\*or Physics with Calculus

ATTENTION: PHYS 390 offered in even years ONLY.

Visit our Web site: <http://www.puc.edu> (Click [academics](#). See appropriate entries under [Academic Departments](#), [Academic Programs](#), and [Departmental Home Pages](#).)

### What the Degree Includes

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