CAL POLY POMONA

Name:
Plan: **Physics, B.S.**
SubPlan/Option: **Biophysics**
Min. Units Required: **120 units**

2018-2019 University Catalog
Degree Curriculum Sheet

Major Required Core — 44 units

CHM1210 - General Chemistry I (3) (B1)
CHM1210L - General Chemistry Laboratory I (1) (B3)
MAT1140 - Calculus I (4) (B4)
MAT1150 - Calculus II (4) (B4)
MAT2010 - Introduction to Computational Methods in Mathematics (2)
MAT2010L - Introduction to Computational Methods in Mathematics Laboratory (1)
MAT2140 - Calculus III (4)
MAT2250 - Linear Algebra with Applications to Differential Equations (4)
PHY1510 - Introduction to Newtonian Mechanics (3) (B1)
PHY1510L - Newtonian Mechanics Laboratory (1) (B3)
PHY1520 - Introduction to Electromagnetism and Circuits (3)
PHY1520L - Introductory Laboratory on Electromagnetism and Circuits (1)
PHY2530 - Introduction to Electromagnetic Radiation and Special Relativity (3)
PHY2530L - Introductory Laboratory on Electromagnetic Radiation and Special Relativity (1)
PHY2540 - Introduction to Thermal and Quantum Physics (3)
PHY2540L - Introductory Laboratory on Thermal and Quantum Physics (1)
PHY3600 - Mathematical Methods of Physics I (3)
PHY3600A - Mathematical Methods of Physics I Recitation Activity (1)
PHY4630 - Undergraduate Seminar (1)

Subplan/Option Required Core — 16 units

BIO1210 - Foundations of Biology: Energy, Matter, and Information (3) (B2)
BIO1210L - Foundations of Biology: Energy, Matter, and Information Laboratory (1) (B3)
BIO1220 - Foundations of Biology: Evolution, Ecology, and Biodiversity (3)
BIO1220L - Foundations of Biology: Evolution, Ecology, and Biodiversity Laboratory (1)
CHM1220 - General Chemistry II (3) (B1)
CHM1220L - General Chemistry Laboratory II (1) (B3)
PHY4330 - Thermal and Statistical Physics (3)
PHY4330A - Thermal and Statistical Physics Recitation Activity (1)

Subplan/Option Electives — 19 units

Select 2 units (one pair of lab/activity courses) from the following list:

PHY4510A - Advanced Laboratory Physics - Advanced Instrumentation Recitation Activity (1) and
PHY4510L - Advanced Laboratory Physics - Advanced Instrumentation Laboratory (1)
OR
PHY4520A - Advanced Laboratory Physics - Contemporary Experiments Recitation Activity (1) and
PHY4520L - Advanced Laboratory Physics - Contemporary Experiments Laboratory (1)

Select 4 units (one pair of lecture/activity courses) from the following list:

PHY3210 - Advanced Classical Mechanics (3) and
PHY3210A - Advanced Classical Mechanics Recitation Activity (1)
OR
PHY4010 - Quantum Mechanics I (3) and
PHY4010A - Quantum Mechanics I Recitation Activity (1)
OR
PHY4140 - Electricity and Magnetism I (3) and
PHY4140A - Electricity and Magnetism I Recitation Activity (1)

Select 3 units (one pair of courses) from the following list:

PHY3040 - Electronics for Scientists (2) and
PHY3040L - Electronics for Scientists Laboratory (1)
OR
PHY3440 - Applied Optics (2) and
PHY3440A - Computational Activities in Applied Optics Activity (1)
OR
PHY4090 - Computational Physics (2) and
PHY4090A - Computational Physics Activity (1)
OR
PHY4170 - Wave Optics (2) and
PHY4170L - Wave Optics Laboratory (1)
OR
PHY4610 - Senior Project I (1) and
PHY4620 - Senior Project II (2)

Select 10 units from the following list, with the provisions that at least 1 unit must be a lab class, at least 3 units must be upper-division, and at least 3 units must be from biology. Paired corequisite courses are indicated via "and" in the list:

BIO2060 - Basic Microbiology (3) and
BIO2060L - Basic Microbiology Laboratory (1)

BIO2340 - Human Anatomy (2) and
BIO2340L - Human Anatomy Laboratory (2)

BIO2350 - Human Physiology (3) and
BIO2350L - Human Physiology Laboratory (1)

BIO2400 - Genetics (3)
BIO3220 - Cell and Molecular Biology (3)

BIO4020 - Developmental Biology (3) and
BIO4020L - Developmental Biology Laboratory (1)

BIO4100 - Biophysics (3)
PHY4100 - Biophysics (3)

BIO4190 - Neuroscience I: Cell and Molecular Processes (3) and
BIO4190L - Neuroscience I: Cell and Molecular Processes Laboratory (1)

BIO4240 - Neuromuscular Physiology (3)
BIO4259 - Neuroscience II: Neural Systems (3)

BIO4320 - Molecular Biology Techniques (3) and
BIO4320L - Molecular Biology Techniques Laboratory (1)

BIO4360 - Recombinant DNA and Protein Technology (3) and
BIO4360L - Recombinant DNA and Protein Technology Laboratory (1)

BIO4380 - Bioinformatics (2) and
BIO4380L - Bioinformatics Laboratory (2)

BIO4450 - Physiology I: Cells (3) and
BIO4450L - Physiology I: Cells Laboratory (1)

BIO4460 - Physiology II: Systems (3) and
BIO4460L - Physiology II: Systems Laboratory (1)

BIO4660 - Microbial Physiology (3) and
BIO4660L - Microbial Physiology Laboratory (1)

BIO4670 - General Virology (3) and
BIO4670L - General Virology Laboratory (1)

CHM2010 - Elements of Organic Chemistry (3) and
CHM2010L - Elements of Organic Chemistry Laboratory (1)

CHM2600 - Introduction to Organic Molecular Modeling (3)
CHM3110 - Classical Physical Chemistry (3)
CHM3120 - Quantum Physical Chemistry (3)

CHM3140 - Organic Chemistry I (4) and
CHM3140L - Organic Chemistry Laboratory I (1)

CHM3210 - Elements of Biochemistry (3) or
CHM3270 - Biochemistry I (3)

AND
CHM3270L - Biochemistry Laboratory I (1)

CHM3280 - Biochemistry II (3) and
CHM3280L - Biochemistry Laboratory II (1)

CHM4210 - Solution Equilibria in Analytical Chemistry (2)

Unrestricted Electives — 0-2 units

Select a sufficient number of courses so that the total from " Major Required Core", "Subplan/Option Required Core", "GE", and "Unrestricted Electives" is at least 101 units.

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

Area B. Scientific Inquiry and Quantitative Reasoning (12 units)
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)
1. Visual and Performing Arts
2a. Philosophy and Civilization
2b. Literature and Language Other than English
3. Arts and Humanities Synthesis

Area D. Social Sciences (12 units)
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*
Freshman	*IGE 1100, IGE 1200*	*A2 and C2b*
Sophomore	*IGE 2100, IGE 2200*	*C1 and C2a*
Junior	*IGE 2300, IGE 2400*	*D1 and D3*
Senior	*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.