

# Biophysics

The Biophysics Graduate Group is an interdisciplinary PhD program hosted by the California Institute for the Biosciences (QB3). Our program trains graduate students for careers at the interface of the biological and physical sciences. This interdisciplinary group provides an opportunity for interested students to receive training leading to the PhD in biophysics. Approximately 58 faculty members are affiliated with the Biophysics Group, spanning over a dozen departments and groups at UC Berkeley. Students may work under the supervision of any faculty member belonging to the group.

Students interested in pursuing graduate work in biophysics typically acquire undergraduate training in one of the basic physical or biological sciences and during the first two years at UC Berkeley take self-selected courses in biology, physics, and chemistry to fill in any gaps in foundational knowledge.

## Admission to the University

### Uniform minimum requirements for admission

The following minimum requirements apply to all programs and will be verified by the Graduate Division:

1. A bachelor's degree or recognized equivalent from an accredited institution;
2. A minimum grade-point average of B or better (3.0);
3. If the applicant comes from a country or political entity (e.g. Quebec) where English is not the official language, adequate proficiency in English to do graduate work, as evidenced by a TOEFL score of at least 570 on the paper-and-pencil test, 230 on the computer-based test, 90 on the iBT test, or an IELTS Band score of at least 7 (note that individual programs may set higher levels for any of these); and
4. Enough undergraduate training to do graduate work in the given field.

### Applicants who already hold a graduate degree

The Graduate Council views academic degrees as evidence of broad research training, not as vocational training certificates; therefore, applicants who already have academic graduate degrees should be able to take up new subject matter on a serious level without undertaking a graduate program, unless the fields are completely dissimilar.

Programs may consider students for an additional academic master's or professional master's degree if the additional degree is in a distinctly different field.

Applicants admitted to a doctoral program that requires a master's degree to be earned at Berkeley as a prerequisite (even though the applicant already has a master's degree from another institution in the same or a closely allied field of study) will be permitted to undertake the second master's degree, despite the overlap in field.

The Graduate Division will admit students for a second doctoral degree only if they meet the following guidelines:

1. Applicants with doctoral degrees may be admitted for an additional doctoral degree only if that degree program is in a general area of

knowledge distinctly different from the field in which they earned their original degree. For example, a physics PhD could be admitted to a doctoral degree program in music or history; however, a student with a doctoral degree in mathematics would not be permitted to add a PhD in statistics.

2. Applicants who hold the PhD degree may be admitted to a professional doctorate or professional master's degree program if there is no duplication of training involved.

Applicants may only apply to one single degree program or one concurrent degree program per admission cycle.

Any applicant who was previously registered at Berkeley as a graduate student, no matter how briefly, must apply for readmission, not admission, even if the new application is to a different program.

## Required documents for admissions applications

1. **Transcripts:** Upload unofficial transcripts with the application for the departmental initial review. Official transcripts of all college-level work will be required **if admitted**. Official transcripts must be in sealed envelopes as issued by the school(s) you have attended. Request a current transcript from every post-secondary school that you have attended, including community colleges, summer sessions, and extension programs. If you have attended Berkeley, upload unofficial transcript with the application for the departmental initial review. Official transcript with evidence of degree conferral **will not** be required if admitted.
2. **Letters of recommendation:** Applicants can request online letters of recommendation through the online application system. Hard copies of recommendation letters must be sent directly to the program, not the Graduate Division.
3. **Evidence of English language proficiency:** All applicants from countries in which the official language is not English are required to submit official evidence of English language proficiency. This requirement applies to applicants from Bangladesh, Burma, Nepal, India, Pakistan, Latin America, the Middle East, the People's Republic of China, Taiwan, Japan, Korea, Southeast Asia, and most European countries. However, applicants who, at the time of application, have already completed at least one year of full-time academic course work with grades of B or better at a U.S. university may submit an official transcript from the U.S. university to fulfill this requirement. The following courses will not fulfill this requirement: 1) courses in English as a Second Language, 2) courses conducted in a language other than English, 3) courses that will be completed after the application is submitted, and 4) courses of a non-academic nature. If applicants have previously been denied admission to Berkeley on the basis of their English language proficiency, they must submit new test scores that meet the current minimum from one of the standardized tests.

## Admission to the Program

Applicants should have sufficient undergraduate training to undertake graduate work in the chosen field. This includes such undergraduate majors as: biological sciences, structural biology, physics, math, and/or chemistry. Laboratory experience is expected.

Typical students admitted to the program have demonstrated outstanding potential as a research scientist and have clear academic aptitude in multiple disciplines, as well as excellent communication skills. This is assessed based on research experience, grades, standardized

exams, course selection, essays, personal background, and letters of recommendation.

Average GRE scores considered for admissions are in the 80th percentile. We do not have set requirements for GRE scores, but generally admit students in the 80th and 90th percentile. GRE subject tests are not required, but will be reviewed if submitted with the application.

## Normative Time Requirements

### Normative Time to Advancement

Normative Time to Advancement is 2 years.

#### Year 1

Students perform three laboratory rotations with the chief aim of identifying a research area and thesis laboratory.

#### Year 2

Students attend seminars, prepare a dissertation prospectus, and prepare for their PhD oral qualifying examination. With the successful passing of the orals, students select their thesis committee and advance to candidacy for the PhD degree.

### Normative Time in Candidacy

#### Years 3 to 5

Students undertake research for the PhD dissertation under a self-selected four-person committee in charge of their research and dissertation. Students conduct original laboratory research, and then write the dissertation based on the results of this research. On completion of the research and approval of the dissertation by the committee, the students are awarded the doctorate.

### Total Normative Time

Total Normative Time is 5-5.6 years.

## Time to Advancement

### Curriculum

#### Courses Required

BIOPHY 293A	Research Seminar: Faculty Evening Research Presentations (FERPS) and Student Evening Research Presentations (SERPS)	2
BIOPHY 293B	Research Seminar: Faculty Evening Research Presentations (FERPS) and Student Evening Research Presentations (SERPS)	2
Electives, as per approved study list: Four semesters		
COLWRIT W300	Course Not Available	4
MCELLBI 293C	Responsible Conduct of Research	1

### Lab Rotations

Students conduct three 10-week laboratory rotations in the first year. The thesis lab, where dissertation research will take place, is chosen at the end of the third rotation in late April/early May.

### Prospectus

The prospectus will include a description of the specific research problem, but will serve as a framework for the QE committee members to probe the student's foundational knowledge in the field and area of

research. Proposals will be written in the manner of a NIH-style grant proposal. The prospectus must be completed and submitted to the Chair no fewer than four weeks prior to the oral Qualifying Examination.

### QE

The Qualifying Examination will evaluate a student's depth of knowledge in his or her research area, breadth of knowledge in fundamentals of biophysics, ability to formulate a research plan, and critical thinking.

Students are expected to pass the Qualifying Examination by the end of the fourth semester in the program.

## Time in Candidacy

### Advancement

After passing the qualifying exam by the end of the second year, students have until the fifth semester to select a thesis committee and submit the Advancement to Candidacy paperwork to the Graduate Division.

### Dissertation

Primary dissertation research is conducted in years 3-5/5.5.

Requirements for the dissertation are decided in consultation with the thesis adviser and thesis committee members. To this end, students are required to have yearly thesis committee meetings with the committee after advancing to candidacy.

### Dissertation Presentation/Finishing Talk

There is no formal defense of the completed dissertation; however, students are expected to publicly present a talk about their dissertation research in their final year.

## Required Professional Development

### Presentations

All biophysics students are expected to attend the annual retreat, and will regularly present research talks there. They are also encouraged to attend national and international conferences to present research.

### Teaching

Biophysics students are required to teach one semester, and may teach more. The teaching requirement may be waived if the student creates and teaches a Biophysics module (student-run 5-week workshops)

## Biophysics

BIOPHY 292 Research 3 - 12 Units

Individual research under the supervision of a faculty member.

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit. Course may be repeated for credit when topic changes.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3-12 hours of independent study per week

**Summer:** 10 weeks - 3-12 hours of independent study per week

### Additional Details

**Subject/Course Level:** Biophysics/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

BIOPHY 293A Research Seminar: Faculty Evening Research Presentations (FERPS) and Student Evening Research Presentations (SERPS) 2 Units

Seminar on presentation and evaluation of results in area of student's individual research interests.

### Rules & Requirements

**Prerequisites:** 292

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Biophysics/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only. This is part one of a year long series course. A provisional grade of IP (in progress) will be applied and later replaced with the final grade after completing part two of the series.

BIOPHY 293B Research Seminar: Faculty Evening Research Presentations (FERPS) and Student Evening Research Presentations (SERPS) 2 Units

Seminar on presentation and evaluation of results in area of student's individual research interests.

### Rules & Requirements

**Prerequisites:** 293A, and 292

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Biophysics/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only. This is part two of a year long series course. Upon completion, the final grade will be applied to both parts of the series.