The interdisciplinary Graduate Group in Comparative Biochemistry administers the PhD degree for students interested in a biochemical and molecular approach to problems in the biological sciences. Students work under the supervision of faculty from diverse disciplines including Molecular and Cell Biology; Nutritional Science and Toxicology; Plant and Microbial Biology; Chemistry; Chemical Engineering; Environmental Science, Policy, and Management; Public Health; and the Lawrence Berkeley National Laboratory.

**Admission to the University**

**Minimum Requirements for Admission**

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

1. A bachelor’s degree or recognized equivalent from an accredited institution;
2. A 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 90 on the iBT test, 570 on the paper-and-pencil test, or an IELTS Band score of at least 7 on a 9-point scale (note that individual programs may set higher levels for any of these); and
4. Sufficient undergraduate training to do graduate work in the given field.

**Applicants Who Already Hold a Graduate Degree**

The Graduate Council views academic degrees not as vocational training certificates, but as evidence of broad training in research methods, independent study, and articulation of learning. Therefore, applicants who already have academic graduate degrees should be able to pursue new subject matter at an advanced level without the need to enroll in a related or similar graduate program.

Programs may consider students for an additional academic master’s or professional master’s degree only 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 apply only to one single degree program or one concurrent degree program per admission cycle.

**Required Documents for Applications**

1. **Transcripts:** Applicants may upload unofficial transcripts with your application for the departmental initial review. *If the applicant is admitted, then official transcripts of all college-level work will be required.* Official transcripts must be in sealed envelopes as issued by the school(s) attended. If you have attended Berkeley, upload your unofficial transcript with your application for the departmental initial review. *If you are admitted, an official transcript with evidence of degree conferral will not be required.*

2. **Letters of recommendation:** Applicants may 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 or political entities in which the official language is not English are required to submit official evidence of English language proficiency. This 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, most European countries, and Quebec (Canada). 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 US university may submit an official transcript from the US university to fulfill this requirement. The following courses will not fulfill this requirement:
   - courses in English as a Second Language,
   - courses conducted in a language other than English,
   - courses that will be completed after the application is submitted, and
   - 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. Official TOEFL score reports must be sent directly from Educational Test Services (ETS). The institution code for Berkeley is 4833. Official IELTS score reports must be mailed directly to our office from the British Council. TOEFL and IELTS score reports are only valid for two years.

**Where to Apply**

Visit the Berkeley Graduate Division application page (http://grad.berkeley.edu/admissions/apply).

**Normative Time Requirements**

Normative time is defined as the elapsed time in years that under normal circumstances would be needed to complete all requirements for the PhD degree assuming that the student engaged in full-time, uninterrupted study and is making desirable progress toward the degree. Normative time for Comparative Biochemistry is five years. Requirements include completion of course work, an oral qualifying exam, and a Ph.D. dissertation. Listed below are a sample of courses that students may
Curriculum

Courses Required (examples)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>MCELLBI 110</td>
<td>Molecular Biology: Macromolecular Synthesis and Cellular Function</td>
<td>4</td>
</tr>
<tr>
<td>MCELLBI 200A</td>
<td>Fundamentals of Molecular and Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>PLANTBI 200A</td>
<td>Plant Developmental Genetics</td>
<td>1.5</td>
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<tr>
<td>NUSCTX 250</td>
<td>Advanced Topics in Metabolic Biology</td>
<td>3</td>
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<tr>
<td>MCELLBI C214</td>
<td>Protein Chemistry, Enzymology, and Bio-organic Chemistry</td>
<td>2</td>
</tr>
<tr>
<td>MCELLBI 230</td>
<td>Advanced Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>MCELLBI 206</td>
<td>Physical Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 270A/270B</td>
<td>Advanced Biophysical Chemistry I</td>
<td>1</td>
</tr>
<tr>
<td>COMPBIO 294</td>
<td>Comparative Biochemistry Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Grad Elective Courses per approved study list

Grad Elective Seminar per approved study list

COMPBIO 299 Graduate Research 1 - 12 Units

Terms offered: Fall 2019, Spring 2019, Fall 2018

Graduate student research.

Graduate Research: Read More [+]

Rules & Requirements

Prerequisites: Graduate standing in the Comparative Biochemistry Graduate Group

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-12 hours of independent study per week

Summer:
6 weeks - 2.5-30 hours of independent study per week
8 weeks - 1.5-22.5 hours of independent study per week

Additional Details

Subject/Course Level: Comparative Biochemistry/Graduate

Grading: Letter grade.

Graduate Research: Read Less [-]

COMPBIO 294 Comparative Biochemistry Seminar 1 Unit

Terms offered: Fall 2019, Fall 2018, Fall 2017

The objective of this course is to provide an overview of the research activities conducted by faculty members of the Graduate Group in Comparative Biochemistry. The lectures will cover a wide range of interdisciplinary research topics reflecting the breadth of the Group. An important goal of this course is to enhance intellectual and collaborative interactions between students and faculty of the Graduate Group by increasing awareness of the range of research projects. The course will be conducted in a seminar format and is required for students new to the Graduate Group. It is also recommended for advanced students currently in the Group.

Comparative Biochemistry Seminar: Read More [+]

Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Comparative Biochemistry/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Comparative Biochemistry Seminar: Read Less [-]