Microbiology

The Graduate Group in Microbiology is composed of 53 faculty from diverse departments, colleges, and schools (Plant and Microbial Biology; Molecular and Cell Biology; Public Health; Civil and Environmental Engineering; Chemical and Biomolecular Engineering; Environmental Science, Policy, and Management; Nutritional Sciences and Toxicology; Optometry; and Integrative Biology) and is administered by the Department of Plant and Microbial Biology. The group awards the PhD degree in Microbiology. Students in the group have access to diverse disciplines through an integrated program of study that allows each student to pursue specialized interests. Students gain a breadth of understanding of microbiology from the molecular to the cellular levels of organization, as well as the interactions of microbes—beneficial and pathogenic—with other organisms.

Faculty in the Graduate Group in Microbiology have research interests in four broad areas: ecology and evolution, genetics and development, physiology and biochemistry, and host-microbe interactions. The research of many faculty spans more than one of these categories. In addition, the research goals vary from addressing fundamental questions in biology to applied studies in the control or use of microbes. Some faculty conduct research on both fundamental and applied topics.

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 (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 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.

Where to Apply

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

Admission to the Program

Students admitted to the Graduate Group in Microbiology program are expected to demonstrate academic excellence and potential for independent scientific research and to have satisfied, or satisfy through

additional coursework, the curriculum required of an undergraduate major in microbial biology. Students are expected to have a background in chemistry, physics, mathematics, and biology. An admissions committee composed of nine faculty members and one graduate student will review applications and make recommendations to the full faculty on admissions matters. Recommendations for admission will be based on grades in university-level undergraduate and graduate courses, letters of recommendation, written statements of academic and professional goals, and other evidence of academic accomplishment. Scores on standardized tests, such as the Graduate Record Examination, are required of all applicants.

Normative Time Requirements

Normative Time to Advancement

Normative time to advancement to PhD candidacy is two years.

Year 1

Students perform three laboratory rotations in order to explore areas of research interest and identify a faculty mentor, dissertation project, and laboratory. Students undertake required core classes and attend seminars of interest.

Year 2

Students attend seminars, enroll in core courses, perform their first teaching assignment, and prepare for the PhD qualifying exam which consists of two research proposals and an oral examination. With the successful passing of the qualifying exam, students select a dissertation committee and advance to candidacy for the PhD degree prior to the start of the fifth semester.

Normative Time in Candidacy

Years 3–5/5.5

Students attend seminars of interest and perform their second teaching assignment. Students conduct original laboratory research for the PhD dissertation with the guidance of their faculty mentor and a self-selected three to four person dissertation committee. Students are required to meet annually with the dissertation committee. Students write the dissertation based on the results of their research. Upon approval of the dissertation by the dissertation committee and Graduate Division, students are awarded the doctorate. There is no formal defense of the completed dissertation; however, students are required to publicly present a talk about their research in the final year.

Total Normative Time

Total normative time to degree is 5–5.5 years.

Time to Advancement

Curriculum

PLANTBI 202	Faculty Research Review	2
PLANTBI 205A	Introduction to Research	2-12
PLANTBI 205B	Introduction to Research	2-12
PLANTBI 210	Scientific Reasoning and Logic	1
PLANTBI 220A	Microbial Genetics	1.5
PLANTBI 220B	Genomics and Computational Biology	1.5
PLANTBI 220C	Microbial Diversity and Evolution	1.5
PLANTBI 220D	Cell Structure and Function	1.5
PLANTBI 220E	Microbial Physiology	1.5
PLANTBI 220F	Microbial Ecology	1.5
PLANTBI C242	Course Not Available	
PLANTBI 290	Seminar (or equivalent)	2
PLANTBI 292	Research Review in Plant and Microbial Biology	1
PLANTBI 298	Plant Biology Group Studies (department colloquium)	1-6
PLANTBI 299	Graduate Research	1-12
PLANTBI 375	Workshop on Teaching	2
PLANTBI 602	Individual Study for Graduate Students	1-8

Professional Development

Research Presentations

All microbiology graduate students are strongly encouraged to present their research annually from the third year and beyond in a public forum. Graduate students attend the Plant & Microbial Biology (PMB) Department retreat at least once during their graduate studies. Students are encouraged to attend both the Plant & Microbial Biology Department retreat and the Graduate Group in Microbiology retreat and present their research. Students are highly encouraged to present during the PMB Department student/post-doc seminar series. They are also encouraged to attend national and international conferences to present research.

Teaching

Microbiology graduate students are required to teach two semesters. Students are required to teach in two distinctly different classroom settings; specifically, teaching in a large enrollment course (100+) and a small upper division, lab, or low enrollment (< 100) course.

Grant Writing

Students are encouraged to take PLANTBI 297, Grant Writing and Research Presentation.