

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

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

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 Ph.D. candidacy is 2 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, perform their first teaching assignment, and prepare for the Ph.D. 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 Ph.D. degree prior to the start of the 5th 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 Ph.D. dissertation with the guidance of their faculty mentor and a self-selected 3 to 4 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 expected 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 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 202	Faculty Research Review	2
PLANTBI 210	Scientific Reasoning and Logic	1
PLANTBI 290	Seminar (or equivalent)	2

PLANTBI 299	Graduate Research	1-12
PLANTBI 300	Course Not Available (1 semester required)	2
PLANTBI 298	Plant Biology Group Studies (department colloquium)	1-6

Professional Development

Research Presentations

All microbiology 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.