

# Biotechnology

The Master of Biotechnology program is an accelerated one-year program with a 30-unit graduation requirement. Beginning in early July, all students take intensive core lab courses followed by complementary courses that will introduce students to the field of biotechnology, expand their knowledge of key biological concepts, and provide opportunities for students' professional development. The final semester will be largely devoted to students' internships, culminating in a capstone project report and presentation.

As part of the MCB department, the Master of Biotechnology program is connected to the department's world-renowned faculty (<https://mcb.berkeley.edu/people/faculty/>), who lead labs performing cutting-edge research covering a wide range of modern fields.

We welcome applicants from all backgrounds to apply to our Master of Biotechnology program. Admission to the program is based on a holistic evaluation process and provides multiple opportunities for you to demonstrate your scientific aptitude and potential to succeed during your time in the program and beyond. Our admissions committee takes many factors into consideration as they review each individual application. These factors include, but are not limited to:

- **Undergraduate academic preparation:** What relevant coursework have you taken? Can you explain any weakness in your academic record?
- **Personal attributes:** Are you motivated and curious? Have you demonstrated initiative and shown leadership? What challenges have you overcome in the past?
- **Community building:** What contributions have you made to advancing diversity and how does your lived experience help you understand issues related to diversity, equity, inclusion, and belonging? Shared interests and goals: How do your interests or career goals align with the broader mission of our program?
- **Minimum Requirements Degree:** BA/BS in Biological Sciences or related field GPA: 3.00
- **Required coursework:** General biology, molecular biology and biochemistry, general chemistry, organic chemistry
- **Recommended coursework:** Basic statistics or biostatistics, calculus TOEFL/IELTS (international students only) Minimum TOEFL score: 90 for internet-based, 233 for computer-based, 570 for paper test Minimum IELTS score: 7.0 out of 9.0

## Applying for Graduate Admission

Thank you for considering UC Berkeley for graduate study! UC Berkeley offers more than 120 graduate programs representing the breadth and depth of interdisciplinary scholarship. A complete list of graduate academic departments, degrees offered, and application deadlines can be found on the Graduate Division website (<http://grad.berkeley.edu/programs/list/>).

Prospective students must submit an online application to be considered for admission, in addition to any supplemental materials specific to the program for which they are applying. The online application can be found on the Graduate Division website (<http://grad.berkeley.edu/admissions/>).

## Admission Requirements

The minimum graduate admission requirements are:

1. A bachelor's degree or recognized equivalent from an accredited institution;
2. A satisfactory scholastic average, usually a minimum grade-point average (GPA) of 3.0 (B) on a 4.0 scale; and
3. Enough undergraduate training to do graduate work in your chosen field.

For a list of requirements to complete your graduate application, please see the Graduate Division's Admissions Requirements page (<https://grad.berkeley.edu/admissions/steps-to-apply/requirements/>). It is also important to check with the program or department of interest, as they may have additional requirements specific to their program of study and degree. Department contact information can be found here (<http://guide.berkeley.edu/graduate/degree-programs/>).

## Where to apply?

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

### REQUIRED COURSE WORK (30 UNITS TOTAL):

MCELLBI 201A	CRISPR Gene Editing, Stem Cell and Genomic Analysis	6
MCELLBI 201B	CRISPR Gene Editing, Stem Cell and Genomic Analysis	4
MCELLBI 227	Science Writing and Professional Development	2
MCELLBI 275	Therapeutics Development in Biotech: Financing, Regulation and Social Ethics	2
MCELLBI 288	Data Science for Molecular and Cell Biology	3
MCELLBI 289	Master of Biotechnology Capstone Course	5
MCELLBI 292	Research	3-12
One elective course		
Capstone Project Proposal		
Capstone Project Report		
Capstone Project Presentation		

## Core Lab Courses

### Summer and Fall Semesters

Two integrated lab courses (MCELLBI 201A/B) are specifically designed to train students on state-of-the-art technologies and data analysis, including CRISPR/Cas9 genome editing, stem cell culture, and bioinformatics. Students work closely with one another to run experiments, engage in data clubs, and discuss foundational papers in molecular biology.

The first lab course (MCB 201A) beginning in early July is a six-week bootcamp that combines in-depth lectures and discussions with hands-on laboratory sessions. The overarching goal of this class is to train students on the latest molecular techniques used in biomedical research and provide opportunities for students to connect with one another. By the end of this course, students will gain experience in cell culture, CRISPR-Cas9 genome editing, and common molecular biology techniques, while also developing their communication and critical thinking skills.

In the Fall, students take their second lab course (MCB 201B), which continues building upon the work they accomplished during the six-week lab. This second lab course emphasizes bioinformatics and analysis of the data they have generated from lab experiments. Students will learn

fluorescence microscopy, biostatistics, and analysis of big datasets. Ongoing data clubs and journal clubs continue to provide opportunities for students to hone their science communication and critical thinking.

## Core Courses

### Fall and Spring Semesters

Students are required to take all core courses during the Fall and Spring semesters.

The first of these courses (MCB 275) is offered in the Fall and serves to introduce students to the field of biotechnology. This class covers the history of biotechnology, its impact on medicine and society, as well as key methodologies used in the field. Students learn about important therapeutic areas and the range of career options available to them in the biopharmaceutical industry.

Alongside MCB 275, students are required to take MCB 227, a writing and professional development course that will provide coaching on professional career presentation and communication skills, preparing students for their internship interviews that take place towards the end of the Fall semester.

In the Spring semester, students will take MCB 288, a course on drug discovery. This practically-oriented course trains students on biotech workflows for drug discovery, providing them with a familiarity with sample preparation and handling, data management, and centralized databases. A Berkeley Stem Cell research seminar offered to students in the Spring provides opportunities to interact with the broader research community on campus.

## Elective Courses

### Fall and Spring Semesters

Electives courses during the Fall semester function to fill in any gaps in students' conceptual understanding of molecular biology, and electives offered during the Spring semester enable students to tailor their program experience to concentrate more on business or scientific tracks.

Please see the Course Schedule page for an up-to-date list of elective courses offered.

## Internship and Capstone Project

### Spring Semester

The majority of students' Spring semester is devoted to their internships and the completion of their capstone project.

Our program's signature component, a 3-4 month internship, takes place each semester. Our placement and selection process ensures that each student is placed at a local biotech company or campus lab that fits their scientific interests and career goals. During their internship, students will perform full-time research, while working closely with their internship mentor and faculty advisor to develop their capstone project.

Each student's internship will culminate in the completion of their capstone project, an independent research project that the student has been working on during their internship. Once a week during the Spring semester, students will attend a capstone lecture course (MCB 289), where they will meet to discuss as a cohort their internship experiences and receive advice on their individual capstone projects. Towards the end of the program, students will put together a written report and present their work at a one-day research symposium attended by their cohort and faculty. The capstone project will be assessed by a committee composed

of two faculty advisors with the student's industry mentor providing informal feedback.

More information on the internship program and capstone project can be found on the Internship Program page (<https://mcb.berkeley.edu/masters/current-students/internship/>).