Microbial Biology Major Snapshot
Department of Plant & Microbial Biology

Microbial biology is a pivotal field of study because small life forms such as microbes, viruses, and fungi make up the majority of planetary biomass, and constitute key branches of the Tree of Life. Microbes play fundamental roles in maintaining biosphere health: they degrade environmental pollutants; they supply essential nutrients and chemicals directly to multi-cellular organisms, and they engage in numerous beneficial symbioses with higher organisms. Infectious diseases regulate populations of plant and animals, and outbreaks recur in human societies globally.

The major investigates interactions between microorganisms and the environment to determine the role microbes play in maintaining the health of our biosphere. This includes how microbes can help combat environmental pollutants, facilitate energy production, and influence the progress of medical research on infectious diseases.

Advising for the major is available in the CNR Office of Instruction & Student Affairs in 260 Mulford Hall. Students may drop in or schedule an appointment during advising hours: M, Tu, Th, F 9am-12pm and M-F 1-4pm. Visit the MB major website for more detailed information: https://nature.berkeley.edu/advising/majors/microbial-biology

Getting a Degree

To earn a Bachelor of Science from U.C. Berkeley in Microbial Biology, students must fulfill unit and GPA requirements, university and campus requirements, college requirements, and major requirements. Please see the major advisor for more details about the major requirements.

UC Systemwide Requirements

- Entry Level Writing
- American History
- American Institutions

UC Berkeley Requirement

- American Cultures

College and University Unit Requirements ♦ GPA Requirements

- 120 Total Units
- 36 Upper Division Units
- 15 Upper Division Units must be completed in the College of Natural Resources (EEP, ERG, ES, ESPM, NST, PMB)

Students must maintain a 2.0 cumulative GPA, a 2.0 GPA in their MB upper Division major requirements, and not receive a grade below C- in their major requirements (lower and upper division courses).
**Microbial Biology Major Requirements**

### Lower Division Requirements (all major requirements must be taken for a letter grade)

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<th>Math &amp; Statistics</th>
<th>Chemistry</th>
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*Only need Stats if doing either Math 16 or 1 series*

### Physics

| □ Bio 1B: General Biology [4] | □ PMB 22 recommended (not required) |

### Humanities & Social Sciences

15 units of coursework taken from L&S breadth list, excluding biological and physical science courses

maximum of 6 foreign language units

| □ R1A | □ R1B |

### Upper Division Core Requirements

- □ MCB C100A or MCB 102: Biochemistry [4]
- □ PMB C114: Microbial Genomics & Genetics [4]

### Upper Division Core Electives: Choose 2 courses

- □ PMB C103: Bacterial Pathogenesis [3][S] or*
- □ IB 118: Host-Pathogen Interactions [4][F] or*
- □ PH 162A: Public Health Microbiology [3][F]
- □ PMB 104L: Discovery Based Research in MB [2][Su]
- □ PMB C110L: Biology of Fungi [4][F even years]
- □ PMB 113: California Mushrooms [3][F odd years]

### Microbial Biology Concentrations: Choose from Option 1 or 2

**Option 1:** Choose a concentration from below and select four courses. One of the four courses may be selected from the Upper Division Core Electives listed above. This course may not be counted for both the Upper Division Core Electives and your concentration.

**Option 2 (General Microbiology Concentration):** Choose any four courses from the Microbial Biology Concentrations (below) and/or the Upper Division Core Electives (above). Courses selected in Option 2 may not overlap with the two courses used for the Upper Division Core Electives.

### Host-Pathogen Interactions

- □ PMB 135: Physiology & Biochemistry of Plants [3]
- □ PMB 150: Plant Cell Biology [3]
- □ PMB 160: Plant Molecular Genetics [3] or*
- □ MCB 140: General Genetics [4]
- □ MCB 150: Molecular Immunology [5]
- □ BioE 100: Ethics in Science & Engineering [3] or*
- □ IB 119: Evaluating Scientific Evidence in Medicine [3]
- □ PH 150A: Intro to Epidemiology & Human Disease [4]
- □ PH 150B: Intro to Environmental Health Sciences [3]
- □ PMB H196/199: Research [3-4]

### Evolution/Computational Genomics

- □ BioE 143: Computational Methods in Biology [4] or*
- □ BioE 144: Intro to Protein Informatics [4]
- □ BioE 144L: Protein Informatics Lab [2]
- □ CS 61A: The Structure & Interpretation of Computer Programs [4]
- □ CS 61B: Data Structures [4]
- □ IB 160: Evolution [4] or*
- □ IB C166: Evolutionary Biogeography [4]
- □ MCB 140: General Genetics [4]
- □ MCB 143: Evolution of Genomes, Cells & Development [3]
- □ PMB H196/199: Research [3-4]

### Ecology & Environmental Microbiology

- □ BioE 100: Ethics in Science & Engineering [3] or*
- □ ESPM 134: Insects, Fire & Diseases in Forest Ecosystems [3]
- □ PMB C192: Molecular Approaches to Environmental Problem Solving [2] Fall only
- □ IB C166: Evolutionary Biogeography [4]
- □ PMB H196/199: Research [3-4]

### Microbial Biotechnology

- □ PMB 122: Bioenergy [2]
- □ PMB 150: Plant Cell Biology [3]
- □ PMB 170: Modern Applications of Plant Biotechnology [2]
- □ PMB C192: Molecular Approaches to Environmental Problem Solving [2] Fall only
- □ MCB 104: Genetics, Genomics & Cell Biology [4]
- □ MCB 137L: Physical Biology of the Cell [3]
- □ MCB 140: General Genetics [4]
- □ BioE 100: Ethics in Science & Engineering [3] or*
- □ PMB H196/199: Research [3-4]

*No more than one course may be taken from this group to satisfy requirement*