

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.

| and may be and more accusable account and may be a few contents. | | | |
|--|--|--|--|
| 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 | | | |

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).

□ 15 Upper Division Units must be completed in the College of Natural Resources (EEP, ERG, ES, ESPM,

NST. PMB)

| Microbial Biology Major Requirements | | | | | |
|---|---|---|--|--|--|
| Lower Division Requirements (all major requirements must be taken for a letter grade) | | | | | |
| Math & Statistics | | Chemistry | | | |
| □ *Math 10A: Me | thods of Mathematics: Calculus, Statistics, | □ Chem 1A/L: | General Chemistry [4] | | |
| and Combinato | | □ Chem 3A/L: | Organic Chemistry I [5] | | |
| | ethods of Mathematics: Calculus, Statistics, | □ Chem 3B/L: | Organic Chemistry II [5] | | |
| and Combinato | | , | , | | |
| Physics | | Biology | | | |
| □ Physics 8A: | Introductory Physics [4] | □ Bio 1A/L: | General Biology [5] | | |
| I Thysics on. | Thiroductory raysies [4] | □ Bio 1A; L. | General Biology [3] General Biology [4] | | |
| | | - | | | |
| Humanities & Social Sciences | | | nmended (not required) | | |
| | | Reading and Composition Requirement | | | |
| □ 15 units of coursework taken from L&S breadth list, | | □ R1A □ R1E | 3 | | |
| | gical and physical science courses | | | | |
| maximum of 6 | foreign language units | | | | |
| Upper Division Core Requirements | | | | | |
| | 00B, 102, or 110: Biochemistry [4] | □ PMB C148: | Microbial Genomics & Genetics [4] | | |
| I MCD CIOUA, IC | 70B, 102, or 110. Biochemistry [4] | □ PMB C148. | General Microbiology [4/2] | | |
| | | □ PIMB CIIZ/L. | General Microbiology [4/2] | | |
| Upper Division C | Core Electives: Choose 2 courses | | | | |
| • PMB C103: | Bacterial Pathogenesis [3] or* | • PMB C116: | Microbial Diversity [3] | | |
| IB 118: | Host-Pathogen Interactions [4] or* | • PMB 120/L: | Biology of Algae [4] | | |
| PH 162A: | Public Health Microbiology [3] | • PMB 165: | Plant Microbe Interactions [3] | | |
| • PMB C110/L: | Biology of Fungi [4] | • ESPM 112: | Microbial Ecology [3] or* | | |
| • PMB 113: | California Mushrooms [3] | ESPM 131: | Soil Microbial Ecology [3] | | |
| | Comparative Virology [4] | ESPM 131. | Soli Microbial Ecology [5] | | |
| • PMB C114: | Comparative virology [4] | | | | |
| Microbial Biolog | y Concentrations: Choose from Option 1 of | r 2 | | | |
| | a concentration from below and select four | | e four courses may be selected from the | | |
| | re Electives listed above. This course may i | | | | |
| your concentration | | | our and oppor amount our allowands and | | |
| | | | | | |
| Ontion 2 (General | Option 2 (General Microbiology Concentration): Choose any four courses from the Microbial Biology Concentrations (below) | | | | |
| | | | | | |
| and/or the Upper | Division Core Electives (above). Courses se | | | | |
| and/or the Upper for the Upper Divi | Division Core Electives (above). Courses se sion Core Electives. | ected in Option 2 n | nay not overlap with the two courses used | | |
| and/or the Upper for the Upper Divi | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions | ected in Option 2 n Evolut | nay not overlap with the two courses used ion/Computational Genomics | | |
| and/or the Upper for the Upper Divi Ho PMB 135: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] | ected in Option 2 n Evolut BioE 144: | ion/Computational Genomics Intro to Protein Informatics [4] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] | ected in Option 2 n Evolut BioE 144: BioE 144L: | cion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] | ected in Option 2 n Evolut BioE 144: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] | ected in Option 2 n Evolut BioE 144: BioE 144L: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] | Evolut BioE 144: BioE 144L: BioE 131: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* | Evolut BioE 144: BioE 144L: BioE 131: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] | Evolut BioE 144: BioE 144L: BioE 131: CS 61A: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] | Evolut BioE 144: BioE 144L: BioE 131: CS 61A: CS 61B: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] | Evolut BioE 144: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] | Evolut BioE 144: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: | Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] | Evolut BioE 144: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: | Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 115: PH 150A: PH 150B: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] | Evolut BioE 144: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: | Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] | Evolut BioE 144: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: | Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: | Intro to Protein Informatics [4] Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] | Evolut BioE 144: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: | Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 160: IB 166: MCB 140: MCB 143: PMB H196/199: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 160: IB 166: MCB 140: MCB 143: PMB H196/199: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: PMB H196/199: PMB H196/199: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: ESPM 162: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* Bioethics & Society [4] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: PMB H196/199: PMB L122: PMB C124: | Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] Lectures on Energy: Energy from Biomass [3] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: ESPM 162: BioE 135: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* Bioethics & Society [4] Frontiers in Microbial Systems Biology [4] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: PMB H196/199: PMB H196/199: PMB 122: PMB C124: PMB 150: | Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] Lectures on Energy: Energy from Biomass [3] Plant Cell Biology [3] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: ESPM 162: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* Bioethics & Society [4] Frontiers in Microbial Systems Biology [4] Insects, Fire & Diseases in Forest | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: PMB H196/199: PMB 122: PMB C124: PMB 150: MCB 104: | Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] Lectures on Energy: Energy from Biomass [3] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] | | |
| and/or the Upper for the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: ESPM 162: BioE 103: ESPM 162: BioE 103: ESPM 162: BioE 103: ESPM 162: BioE 103: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* Bioethics & Society [4] Frontiers in Microbial Systems Biology [4] Insects, Fire & Diseases in Forest Ecosystems [3] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: PMB H196/199: PMB 122: PMB C124: PMB 150: MCB 104: PMB 170: | Intro to Protein Informatics [4] Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] Lectures on Energy: Energy from Biomass [3] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Modern Applications of Plant Biotechnology [2] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: ESPM 162: BioE 135: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* Bioethics & Society [4] Frontiers in Microbial Systems Biology [4] Insects, Fire & Diseases in Forest Ecosystems [3] Molecular Approaches to Environmental | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: MCB 143: PMB H196/199: PMB 122: PMB C124: PMB 150: MCB 104: PMB 170: BioE 100: | Intro to Protein Informatics [4] Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] Lectures on Energy: Energy from Biomass [3] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Modern Applications of Plant Biotechnology [2] Ethics in Science & Engineering [3] or* | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: ESPM 162: BioE 100: ESPM 162: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* Bioethics & Society [4] Frontiers in Microbial Systems Biology [4] Insects, Fire & Diseases in Forest Ecosystems [3] Molecular Approaches to Environmental Problem Solving [2] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: PMB H196/199: PMB C124: PMB C124: PMB 150: MCB 104: PMB 170: BioE 100: ESPM 162: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] Lectures on Energy: Energy from Biomass [3] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Modern Applications of Plant Biotechnology [2] Ethics in Science & Engineering [3] or* Bioethics & Society [4] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: ESPM 162: BioE 100: ESPM 162: BioE 135: ESPM 134: PMB C192: IB 153: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* Bioethics & Society [4] Frontiers in Microbial Systems Biology [4] Insects, Fire & Diseases in Forest Ecosystems [3] Molecular Approaches to Environmental Problem Solving [2] Ecology [3] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: MCB 143: PMB H196/199: PMB 122: PMB C124: PMB 150: MCB 104: PMB 170: BioE 100: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] Lectures on Energy: Energy from Biomass [3] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Modern Applications of Plant Biotechnology [2] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Molecular Approaches to Environmental | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: ESPM 162: BioE 135: ESPM 134: PMB C192: IB 153: IB 153: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* Bioethics & Society [4] Frontiers in Microbial Systems Biology [4] Insects, Fire & Diseases in Forest Ecosystems [3] Molecular Approaches to Environmental Problem Solving [2] Ecology [3] Population & Evolutionary Genetics [4] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: PMB H196/199: PMB C124: PMB C124: PMB 150: MCB 104: PMB 170: BioE 100: ESPM 162: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] Lectures on Energy: Energy from Biomass [3] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Modern Applications of Plant Biotechnology [2] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Molecular Approaches to Environmental Problem Solving [2] | | |
| and/or the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: ESPM 162: BioE 100: ESPM 162: BioE 135: ESPM 134: PMB C192: IB 153: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* Bioethics & Society [4] Frontiers in Microbial Systems Biology [4] Insects, Fire & Diseases in Forest Ecosystems [3] Molecular Approaches to Environmental Problem Solving [2] Ecology [3] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 161: IB 166: MCB 140: MCB 143: MCB 143: PMB H196/199: PMB 122: PMB C124: PMB 150: MCB 104: PMB 170: BioE 100: ESPM 162: PMB C192: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] Lectures on Energy: Energy from Biomass [3] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Modern Applications of Plant Biotechnology [2] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Molecular Approaches to Environmental | | |
| and/or the Upper for the Upper for the Upper Divi Ho PMB 135: MCB 150: PMB 150: MCB 104: PMB 160: MCB 140: PMB 185: BioE 100: ESPM 162: IB 115: IB 119: PH 150A: PH 150B: PMB H196/199: Ecology BioE 100: ESPM 162: BioE 135: ESPM 134: PMB C192: IB 153: IB 161: IB 162: | Division Core Electives (above). Courses se sion Core Electives. st-Pathogen Interactions Physiology & Biochemistry of Plants [3] Molecular Immunology [4] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Plant Molecular Genetics [3] or* General Genetics [4] Techniques in Light Microscopy [3] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Intro to Systems in Biology & Medicine [4] Evaluating Scientific Evidence in Medicine [3] Intro to Epidemiology & Human Disease [4] Intro to Environmental Health Sciences [3] Research [3-4] & Environmental Microbiology Ethics in Science & Engineering [3] or* Bioethics & Society [4] Frontiers in Microbial Systems Biology [4] Insects, Fire & Diseases in Forest Ecosystems [3] Molecular Approaches to Environmental Problem Solving [2] Ecology [3] Population & Evolutionary Genetics [4] Ecological Genetics [4] | Evolut BioE 144: BioE 144L: BioE 144L: BioE 131: CS 61A: CS 61B: BioE 143: Math 127: PMB C109L: IB 160: IB 160: IB 161: IB 166: MCB 143: MCB 143: PMB H196/199: PMB 122: PMB C124: PMB 150: MCB 104: PMB 170: BioE 100: ESPM 162: PMB C192: MCB 137: | ion/Computational Genomics Intro to Protein Informatics [4] Protein Informatics Lab [2] Intro to Computational Molecular & Cell Biology [4] The Structure & Interpretation of Computer Programs [4] Data Structures [4] Computational Methods in Biology [4] or* Mathematical & Computational Methods in Molecular Biology [4] Evolution and Ecology of Development [3] Evolution [4] or* Population & Evolutionary Genetics [4] Evolutionary Biogeography [4] General Genetics [4] Evolution of Genomes, Cells & Development [3] Research [3-4] Microbial Biotechnology Bioenergy [2] Lectures on Energy: Energy from Biomass [3] Plant Cell Biology [3] Genetics, Genomics & Cell Biology [4] Modern Applications of Plant Biotechnology [2] Ethics in Science & Engineering [3] or* Bioethics & Society [4] Molecular Approaches to Environmental Problem Solving [2] Computer Simulation in Biology [3] | | |

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

PMB H196/199: Research [3-4]

^{*}Students seeking exception to the Math 10A and Math 10B requirement must contact the MB major undergraduate advisor