# Genetics & Plant Biology Major Snapshot
## Department of Plant & Microbial Biology

From oxygen to food to shelter to energy to shade, plants provide us with virtually everything we need to survive and to thrive. Genetics and Plant Biology (GPB) majors study the distribution and diversity of plant life from the sub-molecular to the organismal level. There is momentous work to be done for those who want to unravel the mystery of genes, bring expertise to medical school, educate future biologists, or develop methods to feed the world!

Genetics and Plant Biology (GPB) combines traditional plant sciences (physiology, biochemistry, morphology) with more recent biological disciplines (molecular genetics and genomics) to study the role of plants in the global environment. The discipline emphasizes the study of plants from the sub-molecular levels to the organismal level. Relevant applications include biotechnology, bioenergy, agriculture, biomedical, food science, bio informatics, and genetic counseling.

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 GPB Major website for more detailed information: https://nature.berkeley.edu/advising/majors/genetics-and-plant-biology

### Getting a Degree

To earn a Bachelor of Science from UC Berkeley in Genetics and Plant Biology, students must fulfill unit and GPA requirements, university and campus requirements, college requirements, and major requirements. Please see reversed side for more details about the major requirements. Feel free to contact the major advisor for further questions.

### 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 (This is fulfilled by the GPB Upper Division Core Requirements)

Students must maintain a 2.0 cumulative GPA, a 2.0 GPA in their GPB upper division major requirements, and not receive a grade below C- in their major requirements (lower and upper division courses).

*Updated 4/29/16*

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

| Math & Statistics | Chemistry |
|---|---|
| □ *Math 10A: Methods of Mathematics: Calculus, Statistics, and Combinatorics [4]<br>□ *Math 10B: Methods of Mathematics: Calculus, Statistics, and Combinatorics [4] | □ Chem 1A/L: General Chemistry [4]<br>□ Chem 3A/L: Organic Chemistry I [5]<br>□ Chem 3B/L: Organic Chemistry II [5] |
| **Physics** | **Biology** |
| □ Physics 8A: Introductory Physics [4] | □ Bio 1A/L: General Biology [5]<br>□ Bio 1B: General Biology [4]<br>□ *PMB 20 and/or PMB 40 recommended (not required)* |
| **Humanities & Social Sciences** | **Reading and Composition Requirement** |
| □ 15 units of coursework from L&S breadth list, excluding biological and physical sciences (*maximum of 6 foreign language units)* | □ R1A □ R1B |

**Upper Division Core Requirements**

□ PMB 135: Physiology and Biochemistry of Plants [3][F]
□ PMB 150: Plant Cell Biology [3][F]
□ PMB 160: Plant Molecular Genetics [3][SP]
□ PMB C107L: Principles of Plant Morphology & Lab [4][F]
□ PMB 101L: Experimental Plant Biology Lab [3][SP]

**Plant Biology Concentrations:** Choose from Option 1 or 2

Option 1: Choose a concentration from below and select five courses for a minimum of 14 units.

Option 2 (Experimental Plant Biology Concentration): Design your own concentration. Choose any five courses for a minimum of 14 units from the Plant Biology Concentrations below.

**Biotechnology and Bioenergy**

- PMB C103: Bacterial Pathogenesis [3]
- PMB C112: General Microbiology [4]
- PMB 120: Biology of Algae [2]
- PMB 120L: Laboratory for Biology of Algae [2]
- PMB 122: Bioenergy [2]
- PMB C124: Lectures on Energy: Energy from Biomass [3]
- PMB 142: Plant Genomics and Bioinformatics [2]
- PMB C148: Microbial Genomics and Genetics [4]
- PMB 170: Modern Applications of Plant Biotechnology [2]
- PMB 180: Environmental Plant Biology [2]
- PMB 185: Techniques in Light Microscopy [3]
- Ene,Res C100: Energy and Society [4]
- ESPM 108A: Environmental Change Genetics [3]
- ESPM 152: Global Change Biology [3]
- ESPM 162: Bioethics and Society [4]
- IB 117: Medical Ethnobotany [2]
- IB 117LF: Medical Ethnobotany Laboratory [2]
- IB 151: Plant Physiological Ecology [2]
- IB 151L: Plant Physiological Ecology Laboratory [2]
- IB 162: Ecological Genetics [4]
- MCB 102: Biochemistry and Molecular Biology [4]
- PMB H196/199: Research [2-4]

**Plant Diversity and Evolution**

- PMB C109: Evolution and Ecology of Development [3]
- PMB 110/L: Biology of Fungi [4]
- PMB 113: California Mushrooms [3]
- PMB 120: Biology of Algae [2]
- PMB 120L: Laboratory for Biology of Algae [2]
- PMB 142: Plant Genomics and Bioinformatics [2]
- PMB 180: Environmental Plant Biology [2]
- PMB 185: Techniques in Light Microscopy [3]
- ESPM C105: Natural History Museums & Biodiversity Science [3]
- ESPM 108A: Trees: Taxonomy, Growth and Structure [3]
- ESPM 108B: Environmental Change Genetics [3]
- ESPM C149: Molecular Ecology [2]
- ESPM 152: Global Change Biology [3]
- IB 102LF: California Plants [4]
- IB 117: Medical Ethnobotany [2]
- IB 117LF: Medical Ethnobotany Laboratory [2]
- IB 151: Plant Physiological Ecology [2]
- IB 151L: Plant Physiological Ecology Laboratory [2]
- IB 154: Plant Ecology [3]
- IB 154L: Plant Ecology Laboratory [2]
- IB 157LF: Ecosystems of California [4]
- IB 160: Evolution [4]
- IB 161: Population and Evolutionary Genetics [4]
- IB 162: Ecological Genetics [4]
- IB 163: Molecular and Genomic Evolution [3]
- IB 168L: Systematics of Vascular Plants [4]
- IB 181L: Paleobotany [4]
- PMB H196/199: Research [2-4]

**Plant Genetics, Genomics and Bioinformatics**

- PMB C109: Evolution and Ecology of Development [3]
- PMB C134: Chromosome Biology and Cytogenetics [3]
- PMB 142: Plant Genomics and Bioinformatics [2]
- BioE 144(L): Intro to Protein Informatics [4]; 144L optional [2]
- PMB C148: Microbial Genomics and Genetics [4]
- PMB 165: Plant Microbe Interactions [3]
- PMB 170: Modern Applications of Plant Biotechnology [2]
- PMB 185: Techniques in Light Microscopy [3]
- BioE 131: Intro to Computational Molecular and Cell Biology [4]
- BioE 143: Computational Methods in Biology [4]
- IB 162: Ecological Genetics [4]
- IB 163: Molecular and Genomic Evolution [3]
- Math 127: Math. and Computational Methods in Molecular Biology [4]
- MCB 102: Biochemistry and Molecular Biology [4]
- MCB 130A: Cell and Systems Biology [4]
- ESPM C105: Natural Hist. Museums & Biodiversity Science [3]
- ESPM 108B: Forest Genetics [3]
- PMB H196/199: Research [2-4]

**Plant Microbe Interactions**

- PMB C103: Bacterial Pathogenesis [3]
- PMB 110/L: Biology of Fungi [4]
- PMB C112: General Microbiology [4]
- PMB C112L: Lab for General Microbiology [2]
- PMB 113: California Mushrooms [3]
- PMB C114: Comparative Virology [4]
- PMB C116: Microbial Diversity [3]
- PMB 120: Biology of Algae [2]
- PMB 120L: Laboratory for Biology of Algae [2]
- PMB 142: Plant Genomics and Bioinformatics [2]
- PMB C148: Microbial Genomics and Genetics [4]
- PMB 165: Plant Microbe Interactions [3]
- PMB 180: Environmental Plant Biology [2]
- PMB 185: Techniques in Light Microscopy [3]
- MCB 102: Biochemistry and Molecular Biology [4]
- ESPM C105: Natural History Museums & Biodiversity Science [3]
- ESPM 131: Soil Microbial Ecology [4]
- PMB H196/199: Research [2-4]

*Students seeking exception to the Math 10A and Math 10B requirement should contact the GPB major undergraduate advisor

*Updated 4/29/16*