

Plant Biology

The Graduate Program in Plant Biology is designed to train students in modern research areas of plant biology. Students' courses of study are designed individually, in light of their interests and career goals. The graduate program features an introductory seminar (Faculty Research Review), six five-week core course modules, and additional special topic courses and seminars in areas of faculty specialties. The department has research expertise in the following areas: molecular, cellular, genetic, biochemical, physiological, developmental, and structural biology, and plant-microbe interactions. The core courses cover plant developmental genetics, genomics and computational biology, plant diversity and evolution, plant cell biology, plant biochemistry, and plant systems biology.

Admission to the University

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. The Graduate Division hosts a complete list (<https://grad.berkeley.edu/admissions/choosing-your-program/list/>) of graduate academic programs, departments, degrees offered, and application deadlines can be found on the Graduate Division website.

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 and steps to take to apply can be found on the Graduate Division website (<https://grad.berkeley.edu/admissions/steps-to-apply/>).

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 (<https://guide.berkeley.edu/graduate/degree-programs/>).

Where to apply?

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

Admission to the Program

Prospective students for the graduate program in plant biology are expected to demonstrate academic excellence and potential for independent scientific research. Students are expected to have a

basic background in chemistry, physics, mathematics, and biology equivalent to those in the undergraduate program. An admissions committee composed of nine to ten members of the department will review applications and make recommendations to the full department on admissions matters. Recommendations for admission will be based on a demonstration of academic excellence and potential for independent scientific research as shown by grades in university-level undergraduate and graduate courses, letters of recommendation, written statements of academic and professional goals, and other evidence of academic accomplishment.

Normative Time Requirements

Normative Time to Advancement

Normative time to advancement to PhD candidacy is two 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, enroll in core courses, perform their first teaching assignment, and prepare for the PhD 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 PhD degree prior to the start of the fifth 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 PhD 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 required 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

Courses Required

PLANTBI 200A	Plant Developmental Genetics	1.5
PLANTBI 200B	Genomics and Computational Biology	1.5
PLANTBI 200C	Plant Diversity and Evolution	1.5
PLANTBI 200D	Plant Cell Biology	1.5
PLANTBI 200E	Plant Biochemistry	1.5
PLANTBI 200F	Plant-Environment Interactions	1.5
PLANTBI 201	Faculty Research Review	2
PLANTBI 205A	Introduction to Research	2-12
PLANTBI 205B	Introduction to Research	2-12
PLANTBI 210	Scientific Reasoning and Logic	1

PLANTBI 292	Research Review in Plant and Microbial Biology	1
PLANTBI 290	Seminar (or equivalent)	2
PLANTBI 298	Plant Biology Group Studies	1-6
PLANTBI 299	Graduate Research (multiple)	1-12
PLANTBI 375	Workshop on Teaching	2
PLANTBI 602	Individual Study for Graduate Students	1-2
Total Units		24-61

Professional Development

Research Presentations

All plant biology graduate students are strongly encouraged to present their research annually from the third year and beyond in a public forum. Graduate students attend the Plant and Microbial Biology (PMB) department retreat at least once during their graduate studies. Students are encouraged to attend both the Plant and 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

Plant biology 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.

Plant Biology

PLANTBI 200A Plant Developmental Genetics 1.5 Unit

Terms offered: Fall 2025, Fall 2024, Fall 2023

The students will be provided with both the basic framework and current topics of plant developmental genetics.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Hake

PLANTBI 200B Genomics and Computational Biology 1.5 Unit

Terms offered: Fall 2025, Fall 2024, Fall 2023

Principles of computational and genomic biology. Covers evolutionary, algorithmic, and statistical foundations of sequence analysis, allowing students to understand concepts underlying modern computational methods. Practical applications will be pursued in student-coordinated sessions. Combined lecture with 220B.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Freeling

PLANTBI 200C Plant Diversity and Evolution 1.5 Unit

Terms offered: Fall 2025, Fall 2024, Fall 2023

This course will introduce the students to the diversity of plant form and function and provide them with a basic understanding of the tools and techniques used to study plant diversification and evolution. Molecular and morphological data will be discussed and plant diversity will be introduced at molecular, population, organismal, and ecological levels.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Blackman

PLANTBI 200D Plant Cell Biology 1.5 Unit

Terms offered: Spring 2025, Spring 2024, Spring 2023

The course will describe the conceptual framework of plant cell biology followed by in-depth discussion of several active areas of research including cell wall biology, membrane transport, cellular trafficking, and cell signaling.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Luan

PLANTBI 200E Plant Biochemistry 1.5 Unit

Terms offered: Spring 2025, Spring 2024, Fall 2021

The aim of this course is to augment the student's knowledge of key plant-specific (or particularly relevant) biochemical processes focusing on the underlying experiments used to deduce key cycles coupled with current areas of exploration and debate surrounding a given topic area. In addition, this section will broaden and deepen the student's knowledge of biochemistry in general including basic enzyme kinetics, assessment of enzymatic (biochemical) function, and modes of regulation.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Scheller

PLANTBI 200F Plant-Environment Interactions 1.5 Unit

Terms offered: Spring 2025, Spring 2024, Spring 2023

Students will be provided with both the historical framework and current topics in the molecular mechanisms underlying plant dynamic responses to external signals and stresses.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Harmon

PLANTBI 201 Faculty Research Review 2 Units

Terms offered: Fall 2025, Fall 2024, Fall 2023

Presentation and discussion of faculty research in the areas of plant and microbial biology. Faculty speakers review recent advances in their area of expertise and present an outlook of current research activities in their laboratories. The format of the class is designed to stimulate a dialogue between instructor and students in the course of each presentation.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

PLANTBI 202 Faculty Research Review 2 Units

Terms offered: Fall 2025, Fall 2024, Fall 2023

Presentation and discussion of faculty research in the area of microbial biology. Faculty speakers review recent advances in their area of expertise and present an outlook of current research activities in their laboratories. The format of the class is designed to stimulate a dialogue between instructor and students in the course of each presentation.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

PLANTBI 205A Introduction to Research 2 - 12 Units

Terms offered: Fall 2025, Fall 2024, Fall 2023

Closely supervised experimental work under the direction of an individual faculty member; an introduction to experimental methods and research approaches in particular areas of plant and microbial biology.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 2-12 hours of independent study per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade. This is part one of a year long series course. A provisional grade of IP (in progress) will be applied and later replaced with the final grade after completing part two of the series.

PLANTBI 205B Introduction to Research 2 - 12 Units

Terms offered: Spring 2025, Spring 2024, Spring 2023

Closely supervised experimental work under the direction of an individual faculty member; an introduction to experimental methods and research approaches in particular areas of plant and microbial biology.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 2-12 hours of independent study per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade. This is part two of a year long series course. Upon completion, the final grade will be applied to both parts of the series.

PLANTBI 210 Scientific Reasoning and Logic 1 Unit

Terms offered: Spring 2025, Spring 2024, Spring 2023

The objectives of this class are to teach students to critically read and interpret scientific papers. Students will read and discuss strongly and poorly reasoned papers. At the end of the class the student should understand the logic and reasoning which make a paper strong, often classic, contribution.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Quail

PLANTBI C216 Microbial Diversity Workshop 1 Unit

Terms offered: Fall 2025, Fall 2024, Fall 2022

This workshop for graduate students will parallel C116, Microbial Diversity, which should be taken concurrently. Emphasis in the workshop will be on review of research literature and formulation of paper pertinent to research in microbial diversity.

Rules & Requirements

Prerequisites: Graduate standing; C112 or consent of instructor and organic chemistry (may be taken concurrently)

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of workshop and 1 hour of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Coates

Formerly known as: Molecular and Cell Biology C216, Plant and Microbial Biology C216

Also listed as: MCELLBI C216

PLANTBI 220A Microbial Genetics 1.5 Unit

Terms offered: Fall 2025, Fall 2024, Fall 2023

The students will learn fundamental principles and advanced techniques in microbial genetics. The use of genetics in deducing biochemical pathways, protein interactions, and signal transduction pathways will be explored through reading and discussion of current and classic papers from the primary literature. Experimental design and interpretation will be the focus of problem sets solved in student-coordinated sessions.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Taga

PLANTBI 220B Genomics and Computational Biology 1.5 Unit

Terms offered: Fall 2025, Fall 2024, Fall 2023

Principles of computational and genomic biology. Covers evolutionary, algorithmic, and statistical foundations of sequence analysis, allowing students to understand concepts underlying modern computational methods. Practical applications will be pursued in student-coordinated sessions. Combined lecture with 200B.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Grigoriev

PLANTBI 220C Microbial Diversity and Evolution 1.5 Unit

Terms offered: Fall 2025, Spring 2025, Fall 2024

The students will be provided with both the basic framework and current topics of microbial diversity and evolution.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Brem

PLANTBI 220D Cell Structure and Function 1.5 Unit

Terms offered: Fall 2025, Spring 2025, Fall 2024

The students will be provided with both the basic framework and current topics of cell structure and function.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Komeili

PLANTBI 220E Microbial Physiology 1.5 Unit

Terms offered: Spring 2025, Spring 2024, Spring 2023

The students will be provided with both the basic framework and current topics of microbial physiology.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Coates

PLANTBI 220F Microbial Ecology 1.5 Unit

Terms offered: Spring 2025, Spring 2024, Spring 2023

The students will be provided with both the basic framework and current topics of microbial ecology.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 5 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Lindow

PLANTBI 222 Biochemistry of Biofuels: Concepts and Foundations 1 Unit

Terms offered: Spring 2015, Spring 2014, Spring 2013

This course offers a consideration of genes, enzymes, metabolic pathways and biochemical processes leading to the generation of hydrogen, bio-oils, ethanol, and other biofuels. Discussion of biochemistry is extended to cover product yields and techno-economic analyses of commercial viability of the various biofuel products. Lectures are based on historical and contemporary papers in plant and microbial biochemistry, integrating structure, function and evolution of the molecular, cellular, and organismal levels, and discussing how this knowledge can be applied in the generation of renewable biofuels.

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Melis

PLANTBI C224 The Berkeley Lectures on Energy: Energy from Biomass 3 Units

Terms offered: Fall 2015, Fall 2014, Fall 2013

After an introduction to the different aspects of our global energy consumption, the course will focus on the role of biomass. The course will illustrate how the global scale of energy guides the biomass research. Emphasis will be places on the integration of the biological aspects (crop selection, harvesting, storage, and distribution, and chemical composition of biomass) with the chemical aspects to convert biomass to energy. The course aims to engage students in state-of-art research.

Rules & Requirements

Prerequisites: Biology 1A; Chemistry 1B or 4B, Mathematics 1B

Repeat rules: Course may be repeated for credit under special circumstances: Repeatable when topic changes with consent of instructor.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructors: Bell, Blanch, Clark, Smit, C. Somerville

Also listed as: BIO ENG C281/CHEM C238/CHM ENG C295A

PLANTBI 238 Readings in Environmental Microbiology 1 Unit

Terms offered: Fall 2014, Spring 2014, Fall 2013

Special Topics and Advanced Seminars in Plant Pathology. Seminar/discussion by graduate students of current research in the field of plant pathogenic bacteria.

Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Lindow

Formerly known as: Environmental Science, Policy, and Management 238A

PLANTBI C277 Communicating Quantitative Information 2 Units

Terms offered: Fall 2021, Spring 2020, Spring 2019

This course will cover several aspects of communicating quantitative information, with a primary focus on visualizations for publications, presentations, and posters. Other topics include sharing of data and analyses, such as new publication models and interactive notebooks, as well as lifecycle data management and publication. Primary discussion will be on conceptual issues, and students will be expected to use various systems and resources as self-directed homestudy.

Hours & Format

Fall and/or spring: 15 weeks - 1.5 hours of seminar and 1.5 hours of discussion per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: Brenner

Also listed as: MCELLBI C277

PLANTBI 290 Seminar 1 - 2 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024

Advanced study in various fields of plant biology and microbial biology. Topics will be announced in advance of each semester. Enrollment in more than one section permitted.

Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring:

8 weeks - 2-4 hours of seminar per week

15 weeks - 1-2 hours of seminar per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

PLANTBI 292 Research Review in Plant and Microbial Biology 1 Unit

Terms offered: Fall 2025, Spring 2025, Fall 2024

Lectures, reports, and discussions on current research in plant and microbial biology. Sections are operated independently and directed toward different topics.

Rules & Requirements

Prerequisites: Open to properly qualified graduate students with consent of instructor

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

PLANTBI 296 Graduate Supervised Independent Study 1 - 12 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024

Graduate student independent study under the supervision of a faculty member. Sections are operated independently and directed toward different topics.

Rules & Requirements

Prerequisites: Graduate standing

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-12 hours of independent study per week

Summer:

6 weeks - 2.5-30 hours of independent study per week

8 weeks - 1.5-22.5 hours of independent study per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

PLANTBI 297 Grant Writing and Research Presentations 2 Units

Terms offered: Spring 2024, Spring 2023, Spring 2022

Each student will write a grant proposal in three steps: a one page outline, a three-page pre-proposal, and a complete 10-page grant proposal. There will be feedback at each step in the process -- each participant will review the other grant proposals. Some of the scheduled classes will include discussion of the outlines and pre-proposals, and the last class will be organized as a grant panel, with students assigned as primary and secondary reviewers.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

Instructor: McCormick

PLANTBI 298 Plant Biology Group Studies 1 - 6 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024

Advanced study of research topics which will vary semester to semester. Enrollment in more than one section permitted.

Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-6 hours of colloquium per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: The grading option will be decided by the instructor when the class is offered.

PLANTBI 299 Graduate Research 1 - 12 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024

Graduate student research.

Rules & Requirements

Prerequisites: Graduate standing

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Summer:

6 weeks - 1-12 hours of independent study per week

8 weeks - 1-12 hours of independent study per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate

Grading: Letter grade.

PLANTBI 375 Workshop on Teaching 2 Units

Terms offered: Fall 2020, Fall 2019, Fall 2018

Designed for all graduate students. This course has two goals: discussion of questions and problems relating to the GSI's teaching, and learning how to design and execute a whole course. Effective teaching methods will be introduced by experienced GSIs and faculty. Students will participate in reciprocal classroom visits, visitation and critique of faculty lectures, course design, lecture preparation, sample lecture presentation, and discussion of current literature on teaching.

Rules & Requirements

Prerequisites: Graduate student status

Repeat rules: Course may be repeated for credit up to a total of 4 units.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Professional course for teachers or prospective teachers

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructors: Fischer, Kerfeld

PLANTBI 602 Individual Study for Graduate Students 1 - 2 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024

Individual study in consultation with the major field advisor, intended to provide an opportunity for qualified students to prepare for examinations required of Ph.D. candidates

Rules & Requirements

Prerequisites: Graduate standing and instructor consent

Credit Restrictions: Course does not satisfy unit or residence requirements for doctoral degree.

Repeat rules: Course may be repeated for credit with instructor consent.

Hours & Format

Fall and/or spring: 15 weeks - 1-2 hours of independent study per week

Summer:

6 weeks - 1-2 hours of independent study per week

8 weeks - 1-2 hours of independent study per week

Additional Details

Subject/Course Level: Plant and Microbial Biology/Graduate examination preparation

Grading: Offered for satisfactory/unsatisfactory grade only.