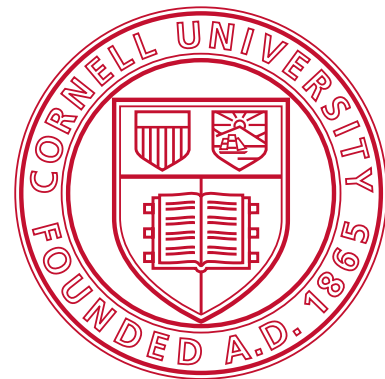


Plant Sciences



The College of Agriculture and Life Sciences (CAL S) is considered the best college of its kind in the nation, if not the world. It is the only college of agriculture and life sciences in the Ivy League and it is the second largest of Cornell University's seven undergraduate colleges.

The twenty-three majors within CAL S all focus on the application of social and life sciences and emphasize the college's four priorities: agriculture and food, the environment, the life sciences, and the social sciences.

For more information about the College of Agriculture and Life Sciences and undergraduate admissions:

- call 607 255-2036
- send an e-mail to als_admissions@cornell.edu
- explore the web site at www.cals.cornell.edu
- write to the Office of Admissions, 177 Roberts Hall, Ithaca, NY 14853-5905

Please note that although interviews are not conducted, interested students and their families are encouraged to visit the college, attend an admissions information session, and tour the campus. To obtain a schedule and to sign up for an information session, visit our web site, www.cals.cornell.edu/admissions, or call the Office of Admissions at 607 255-2036.

Plant Sciences is a multidisciplinary program administered by faculty in the Departments of Crop and Soil Sciences, Horticulture, Plant Biology, Plant Breeding and Genetics, and Plant Pathology. Students in the program share a common interest in topics associated with plant growth and development in the broadest sense, but their individual interests and career goals vary widely.

Students who begin with well-defined interests or who identify specialized interests after several semesters usually choose a specialization within one of the five cooperating departments. Each specialization has additional requirements beyond the basic core courses. Students who are uncertain about the breadth of their interests or who are seeking as much flexibility as possible can design their course of study without declaring a specialization. Those students have fewer required courses, but are still expected to develop a strong background in Plant Sciences.

Career Opportunities

For many students majoring in Plant Sciences, completion of the Bachelor of Science degree is the first step toward graduate or professional study and a career in research and teaching. Many other students, however, have direct ties to agriculture and leave Cornell intent on joining a family business or on starting their own. Some graduates become technicians in research labs; others work in sales of agricultural products such as plant materials, agricultural equipment, and chemicals.

Plant Sciences graduates also have become educators, either with Cooperative Extension or in elementary, secondary, or technical schools.

Undergraduate Programs The Plant Sciences Major.

In addition to the college distribution requirements, Plant Sciences majors must take at least one course in each of several other subject areas including botany, plant physiology, ecology, taxonomy/systematics, genetics, statistics, plant-pest interactions, crop production, and soil science for a minimum total of 40 other required credits. Students choose the remaining 35 to 45 credits in consultation with their academic adviser. These electives usually allow students to gain expertise in a second field of study that will complement their Plant Sciences work. For instance, students interested in a career in marketing plants might take additional business courses, those interested in greenhouse culture might strengthen their background in engineering, while those in plant breeding and genetics or plant biology might take courses in molecular biology and/or biochemistry. Many students use some of their elective credits to do independent research and may write one or more scientific research papers.

Crop Science and Agronomy.

Crop Science and Agronomy are concentrations that focus on the science and the management of the world's major food crops, such as wheat, corn, rice, soy-beans, and alfalfa. In addition to several courses in Crop Science, students in this specialization also take courses in the related disciplines of weed, seed, and soil sciences.

Horticulture.

Derived from the Latin word "hortus," meaning garden, horticulture is a blend of science and culture involving knowledge of plants in farms and gardens, parks and landscapes, athletic and recreational facilities, indoor residential or business environments, and greenhouses and nurseries. Horticulturists also study crops used for wines, herbs and spices, medicines, and coffee and teas. The knowledge and skills essential to grow, maintain, process, and market horticultural plants are in high demand in a world increasingly concerned with environmental quality, recreation, and health.

There are twenty-four faculty members in Horticulture, specializing in almost every aspect of horticultural science, with active research and outreach programs regionally, nationally, and internationally.

Students choosing a concentration in Horticulture must complete the minimum 40 credits of core courses for the Plant Sciences major, plus the following courses:

- HORT 101: Horticultural Science and Systems (4 credits)
- HORT 400: Principles of Plant Propagation (3 credits)
- Two HORT courses in plant production or management at the 400 level (6 credits)
- One additional course in integrated pest management (plant pathology, entomology, or weed science) beyond the 3-credit Plant Sciences core requirement (3 credits)

Viticulture. Students with primary interest in viticulture and secondary interest in enology (V/E) can enroll in the plant sciences degree program, with a concentration in horticulture and a specialization in viticulture. For these students,

plant sciences will be their major, and their required courses in enology (offered within the food science program) will constitute a minor in food science with a concentration in enology.

The curriculum will consist of course work in the basic sciences (e.g., chemistry, biology, microbiology) as well as advanced courses in plant and food sciences. In addition, students will be expected to participate in internships at vineyards and/or with wine makers.

The curriculum is designed to provide students with a strong background in the basic sciences, coupled with a thorough understanding of plant and food sciences as applied to viticulture and wine making. Elective courses can be taken in a variety of areas to support and expand the major.

In addition to gaining a firm foundation in botany and chemistry, students can take specialized courses that include:

- FD SC/HORT 104: Introduction to Enology and Viticulture: Wines and Vines
- HORT 443/444: Viticulture and Vineyard Management I and II
- ENTOM/PL PA tba: Grape Pest Management
- FD SC/HORT tba: Winemaking Technology
- FD SC/HORT tba: Flavor Development in Grapes and Wines
- FD SC 430: Understanding Wine and Beer
- AEM 302: Farm Business Management

Plant Biology.

Plant Biology stresses a basic, rather than applied, understanding of how plants function, grow, and develop, as well as a study of their genome, evolution, and relationships to humans. Plant Biology gives undergraduates thorough preparation for graduate study in Plant Sciences. In cooperation with an adviser, each student plans a curriculum concentrating in basic sciences, supplemented by more advanced courses in Plant Biology. Students concentrating in Plant Biology within the Plant Sciences major should take a minimum of four courses beyond the Plant Sciences core courses. Options include plant molecular biology, plant cell biology, biochemistry, ethnobotany, and further courses in the function, growth, genet-

ics, systematics, ecology, and evolution of plants. Different options within Plant Biology afford a flexible curriculum, and individual research under professorial guidance is encouraged.

Plant Breeding and Genetics.

Plant Breeding and Genetics uses information about genetics/genomics of plants to improve cultivated plant species. Agriculturally important genes are identified, characterized, and deployed through combinations of molecular studies and sexual crosses. This area of study integrates genetic information with plant physiology/biochemistry, plant pathology, entomology, conservation biology, international agriculture, and related areas to create crops that meet the needs of modern society. In addition to the Plant Sciences core courses, students should take:

- BIOPL 343: Molecular Biology and Genetic Engineering of Plants
- PL BR 201: Plants, Genes, and Global Food Production
- PL BR 403: Genetic Improvement of Crop Plants
- PL BR 404: Crop Evolution, Domestication, and Diversity

Students may include other courses after consulting with their adviser. They are encouraged to participate in research projects and take advantage of opportunities for internships in industry.

Plant Pathology.

Plant Pathology is the study of plant diseases—their causes and identification, the molecular basis for pathogenicity and resistance, and disease management. For most students, a concentration in Plant Pathology as an undergraduate is preparation for graduate study in Plant Pathology or another field of Plant Sciences. In addition to the Plant Sciences core courses, students concentrating in Plant Pathology are encouraged to take courses in:

- biochemistry
- calculus
- entomology
- introductory plant pathology
- mycology
- organic chemistry
- plant breeding

Plant Pathology electives include (but are not limited to) courses in subjects such as:

- biochemistry
- cell biology
- computer programming
- crop production
- ecology
- entomology
- horticulture
- plant anatomy
- plant breeding and genetics
- soil microbiology
- statistics

Plant Protection.

Plant Protection is offered to students who are interested in the management of plant pests. It includes the study of insects, diseases, weeds, vertebrate pests, and other factors that prevent maximum crop production. Although designed as a terminal program for students desiring practical preparation for careers in pest management, the specialization can also provide an adequate background for graduate work in entomology, plant pathology, or weed science. In addition to the core Plant Sciences courses, students concentrating in Plant Protection take courses in:

- applied entomology
- farm business management
- general ecology
- integrated pest management
- introductory entomology
- introductory plant pathology
- microbiology
- plant disease control
- weed science

Plant Protection students also take at least two courses in a crop production area, such as:

- forage crops
- grain crops
- ornamental plants
- tropical crops
- vegetable crops

Educational Opportunities

More than 100 courses that deal directly with Plant Sciences are offered by the cooperating departments, and other courses relating to Plant Sciences are offered elsewhere in the university.

In addition to a wide array of formal courses taught by a world-renowned faculty, students in Plant Sciences have extraordinary opportunities to actively participate in faculty research programs. Any student who demonstrates aptitude and interest can become involved in undergraduate research for credit, and those expecting to go on for graduate degrees are especially encouraged to do so.

Students who are planning to enter the workforce immediately upon completion of the Bachelor of Science degree are encouraged to obtain practical experience. This might involve summer employment in a plant production or maintenance industry (such as a lawn and tree care company, commercial greenhouse, nursery, botanical garden or arboretum, or crop production farm) or with Cooperative Extension. Plant Sciences faculty members also encourage students to work and/or study abroad. In fact, several courses require field trips outside of the United States.

Facilities

Five buildings on the Cornell campus house classrooms and laboratories for Plant Sciences study, and six major greenhouse complexes support educational and research programs. Research and teaching facilities within a mile or two of the campus also provide students with ample opportunities for hands-on practical experience. Field facilities available to students include university-owned orchards and vineyards, a turf research/demonstration facility, Cornell Plantations (including several thematic gardens, an arboretum, and several natural areas), two vegetable crop farms, and several field crop farms. Facilities for research and teaching, administered by departments in the Plant Sciences consortium, are strategically located around the state from Long Island to the Adirondacks to the Lake Plains.

Admissions Information

Students enter the Plant Sciences program as freshmen or as transfer students. Those currently enrolled as freshmen or sophomores at other institutions who are considering transferring to Plant Sciences at Cornell are encouraged to satisfy as many of the College of Agriculture and Life Sciences distribution requirements as possible before transferring. Please contact the Office of Admissions for information regarding specific course work required for transfer admission.

For More Information

To learn more about the academic and career opportunities available in Plant Sciences, contact:

General Plant Sciences

Peter J. Davies
Professor of Plant Physiology
Department of Plant Biology
255 Plant Science Building
Cornell University
Ithaca, NY 14853-5908
607 255-8237
pjd2@cornell.edu
www.cals.cornell.edu/Plant_Science.cfm

Crop Sciences

Gary Fick
507 Bradfield Hall
Cornell University
Ithaca, NY 14853-1901
607 255-1704
gwf2@cornell.edu
www.css.cornell.edu

Horticulture, including Enology and Viticulture

Ian Merwin
134-A Plant Science Building
Cornell University
Ithaca, NY 14853-5904
607 255-1777
im13@cornell.edu
www.hort.cornell.edu/instruction/undergrad

Plant Biology

Peter Davies
255 Plant Science Building
Cornell University
Ithaca, NY 14853-5904
607 255-8237
pjd2@cornell.edu
www.plantbio.cornell.edu

Plant Pathology

George Hudler
318 Plant Science Building
Cornell University
Ithaca, NY 14853-5904
607 255-7848
gwh2@cornell.edu

Plant Breeding and Genetics

Mark Sorrells
413 Bradfield Hall
Cornell University
Ithaca, NY 14853-1901
607 255-16605
mes12@cornell.edu

Plant Protection

George Hudler
318 Plant Science Building
Cornell University
Ithaca, NY 14853-5904
607 255-7848
gwh2@cornell.edu