Courses in Plant Biology (PBI)

Graduate

200A. PBGG Core Course Series—Fall (quarter)
Lecture—3 hours; discussion—2 hours. Prerequisite: graduate standing; a broad background of undergraduate-level coursework in Plant Biology is recommended. The first of three PBGG graduate core courses. Coverage includes (1) plant genetics, (2) biochemistry, (3) genomes and gene flow, (4) principles of plant systematics, and (5) the evolution of flowering plants. —F. (F.) Comai, Gepts, Jenkinson, Potter

200B. PBGG Core Course Series—Winter (quarter)
Lecture—3 hours; discussion—2 hours. Prerequisite: course 200A. The second of three PBGG graduate core courses. Coverage includes (1) embryo development, (2) cytoskeleton and vesicle trafficking, (3) cell walls, (4) cell growth, (5) plastids and (7) senescence. —W. (W.) Bradford, Drakakaki, Gilchrist, Harada, Inoue, Lavenholt, Sundaresan, Tan

200C. PBGG Core Course Series—Spring (quarter)
Lecture—3 hours; discussion—2 hours. Prerequisite: course 200A and 200B. The third of three PBGG graduate core courses. Coverage includes (1) plant water relations, (2) cellular & long distance transport processes, (3) mineral nutrition, (4) environmental impacts on growth & development, (5) stress perception & responses, (6) canopy processes, and (7) plant interactions, especially of prey organisms. —S. (S.) Blumwald, Browne, Cook, Dejong, Gilbert, Shackell

203N. Biology of the Plant Cell (4)
Lecture—3 hours; discussion/laboratory—2 hours. Prerequisite: Plant Biology 111 or Biological Sciences 104, or the equivalent. Open to senior undergraduate students in Plant Biology major. Recent progress in plant cell biology. Intracellular motility in plant cells. Common techniques associated with the progress of plant cell biology. Offered irregularly. —Liu

210. Plant Ecophysiology (3)
Lecture—3 hours. Prerequisite: Plant Biology 111, 112, 117. Study of the mechanisms of physiological adaptation of plants to their environment. Offered in alternate years. —W.

212. Physiology of Herbicidal Action (3)
Lecture—3 hours. Prerequisite: Plant Biology 112, 122. Study of the fundamental processes involved in the physiological action of herbicides. Detailed consideration of the fate of herbicides in plants. Offered in alternate years. —S.

214. Higher Plant Cell Walls (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Plant Biology 112. Introduction to the course in biochemistry. Lectures focus on the structure, analysis, synthesis, and development-related metabolism of cell walls. Discussions center on analysis of scientific papers related to lecture topics. Offered in alternate years. —F. Drakakaki, Labavitch

220. Plant Developmental Biology (4)
Lecture—3 hours; discussion—1 hour; term paper. Prerequisite: plant anatomy, physiology, and biochemistry. A survey of the concepts of plant development and organization. Examines plant cells, tissues, and organs with special emphasis on experimental evidence for mechanisms regulating developmental processes. Offered in alternate years. —Sinha

223. Special Topics in Scientific Method (2)
Discussion—2 hours. Examine the historical and philosophical background of the scientific method. Analyze the rational, perceptual, causal, creative and social aspects of doing science. Clarify the roles of reason, experimentation and creativity in scientific research. (S/U grading only.) —F. (F.) Bradford

227. Plant Molecular Biology (4)
Lecture/discussion—4 hours. Prerequisite: Molecular and Cellular Biology 121 or 161. Molecular aspects of higher plant biology with emphasis on gene expression. Plant nuclear and organelle genome organization, gene structure, mechanisms of gene regulation, gene transfer, and special topics related to development and response to biological and environmental stimuli. Offered in alternate years. —Britt, Sinha

229. Molecular Biology of Plant Reproduction (4)
Lecture—3 hours. Molecular genetic basis of plant reproduction. Emphasis on understanding developmentally regulated gene expression as it relates to the major changes that occur during plant reproduction. Offered in alternate years. —O’Neill

290A. Faculty Seminar (1)
Discussion—1 hour. Restricted to Plant Biology (PBGG) graduate students. Discussion of research area of seminar speakers in Plant Biology Graduate Group Seminar Series. May be repeated six times for credit. (S/U grading only.) —F. W. S. (F. W. S.)

290B. Seminar (1)
Seminar—1 hour. Seminars presented by visiting scientists on research of current interest. (S/U grading only.) —F. W. S. (F. W. S.)

290C. Research Conference in Botany (1)
Discussion—1 hour. Prerequisite: graduate standing and/or consent of instructor. Presentation and discussion by faculty and graduate students of research projects in botany. May be repeated for credit. (S/U grading only.) —F. W. S. (F. W. S.)

291. Graduate Student Seminar in Plant Biology (1)
Seminar—1 hour. Prerequisite: graduate student standing. Student-given seminars on topics in plant biology, with critiques by instructor and peers. How to give a seminar, including preparation of visual and other teaching aids. Topic determined by instructor in charge. May be repeated for credit. (S/U grading only.) —F. W. S. (F. W. S.)

292. Seminars in Plant Biology (1)
Seminar—1 hour. Prerequisite: consent of instructor. Review of current literature in botanical disciplines. Discipline and special subjects to be announced quarterly. Students present and analyze assigned topics. May be repeated for credit. (S/U grading only.) —F. W. S. (F. W. S.)

293. Seminar in Postharvest Biology (1)
Discussion—1 hour. Prerequisite: consent of instructor; open to advanced undergraduates. Intensive study of selected topics in the postharvest biology of fruits, vegetables, and ornamentals. May be repeated for credit. (S/U grading only.) —F. W. S. (F. W. S.)

297. Tutoring in Plant Biology (1–5)
Tutorial—2–3 hours. Offers graduate students, particularly those not serving as teaching assistants, the opportunity to gain teaching experience. (S/U grading only.) —F. W. S. (F. W. S.)

298. Group Study (1–5)
May be repeated up to four times for credit. (S/U grading only.)

299. Research (1–12)
Prerequisite: graduate standing. (S/U grading only.)

Professional

300. The Teaching of Plant Biology (2)
Discussion—2 hours. Prerequisite: graduate standing; concurrent appointment as a teaching assistant in Plant Biology. Consideration of the problems of teaching botany, exposure of preparing for and conducting discussions, guiding student laboratory work, and the formulation of questions and topics for examinations. (S/U grading only.) —F. W. S. (F. W. S.)

Graduate Study. The Department of Plant Pathology offers programs of study and research leading to the M.S. and Ph.D. degrees. Information can be obtained from the graduate adviser. See also the Graduate Studies, on page 120.

Graduate Advisers. L. Epstein, G.L. Cooker, R.M. Bostock

Courses in Plant Pathology (PLP)

Lower Division

40. Edible Mushroom Cultivation (2)
Lecture—1 hour; laboratory/discussion—3 hours. Prerequisite: Biological Sciences 10 or Microbiology 20 recommended. Principles and practices of growing edible mushrooms, including culture maintenance, basic mushroom substrate preparation, composting, spawn generation techniques, inoculation methods, harvesting, and pests and pest management. —W. (W.)

Plant Pathology

[College of Agricultural and Environmental Sciences]

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Department Office. 354 Hutchison Hall 530-752-0300; http://plantpathology.ucdavis.edu/

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Lynn Epstein, Ph.D., Professor
Bryce W. Falk, Ph.D., Distinguished Professor
Robert L. Gilbertson, Ph.D., Professor
Thomas R. Gordon, Ph.D., Professor
Johan Leveau, Ph.D., Associate Professor
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Neil McNabbs, Ph.D., Associate Professor
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Pamela C. Ronald, Ph.D., Professor
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R. Michael Davis, Ph.D., Professor Emeritus
John J. Dunaway, Ph.D., Professor Emeritus
Raymond G. Grogan, Ph.D., Professor Emeritus
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Adil Rowhani, Ph.D., Lecturer and Project Scientist
Krishna Subbarao, Ph.D., Lecturer and Specialist in Cooperative Extension
Mysore Sudarsana, Ph.D., (USDA)
Takanos Tabushi, Ph.D., Lecturer (USDA)
Floreau Trulliaus, Ph.D., Lecturer and Assistant Specialist in Cooperative Extension

Related Major Program. See the major in Plant Biology, on page 509.

Graduate Study. The Department of Plant Pathology offers programs of study and research leading to the M.S. and Ph.D. degrees. Information can be obtained from the graduate adviser. See also the Graduate Studies, on page 120.

Graduate Advisers. L. Epstein, G.L. Cooker, R.M. Bostock

Courses in Plant Pathology (PLP)
90. Introduction to Global Disease Biology (1) Seminar—1 hour. Introduction to the Global Disease Biology major, research and internship opportunities, and potential career paths in human, animal, and plant health. Communication, ethics and the nature of science. (P/NP grading only.)—F. (F.) Rizzo

101. Epidemiology (4) Lecture—2 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: Scientific Society and Society 13; Biological Sciences 2A, 2B, 2C; Statistics 13, 100 or Plant Sciences 120. Principles and practice of epidemiology as applied to human, animal, and plant populations and their environment in which these populations coexist. Quantitative analysis of both infectious and non-infectious disease. Inter-dependence between epidemiological analysis, decision-making and policy formulation will be highlighted. GE credit: SciEng, Wrt|SL.—F. (F.) Cook

148. Introductory Mycology (4) Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1C or equivalent. The ecological roles of fungi as saprobes, mutualists and parasites in native and managed ecosystems. Physiological and reproductive strategies associated with adaptations to diverse habitats.—W. (W.) Gordon

185. Advanced Mushroom Taxonomy (2) Laboratory/discussion—3 hours; fieldwork—1 hour. Prerequisite: course 135 or 148, and Biological Sciences 101 or the equivalent. Class size limited to 12 students. Microscopic and molecular methods used in the identification of mushroom species; molecular characterization including PCR-amplification of ribosomal nuclear DNA, digestion of the product with restriction enzymes, and DNA sequencing; a one-day field trip is required. Offered in alternate years.—F.

192. Internships (1-12) Internship—3-40 hours. Prerequisite: course 120 and consent of instructor. Work experience off and on campus, supervised by a member of the faculty. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)

Graduate

201A. Impacts, Mechanisms and Control of Plant Disease (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 120, graduate student status in the Plant Pathology Graduate Program, and consent of instructor. A case-studies approach to analysis of plant diseases caused by bacteria, fungi, oomycetes, and viruses, including impacts, etiology, pathogen taxonomy and epidemiology, and aspects of pathogen-host interactions, virulence and resistance, and approaches to disease control.—W. (W.) Leveau

201B. Impacts, Mechanisms and Control of Plant Disease (3) Lecture—2 hours; discussion—1 hour. Prerequisite: course 120, course 201A, and graduate student status in the Plant Pathology Graduate Program, or consent of instructor. A case-studies approach to analysis of plant diseases, including emerging diseases, caused by bacteria, fungi, oomycetes and viruses, including impacts, etiology, pathogen taxonomy and epidemiology, biotechnological and genetic aspects of pathogen-host interactions, virulence, resistance, and approaches to disease control.—S. (S.) McKibben

205A. Diseases of Vegetable and Field Crops (3) Lecture/discussion—3 hours; fieldwork—3 hours. Prerequisite: course 120. Clinical study of diseases of vegetable and field crops with emphasis on etiology, epidemiology, diagnosis, and control. Field trips required. Offered in alternate years.—S. Gilberston

205B. Diseases of Vegetable and Field Crops—Summer Fieldwork—3 hours. Prerequisite: courses 120 and 205A. Continuation of course 205A—four-day field trip investigating diseases of vegetable and field crops (Deferred grading only, pending completion of sequence.)—Su. (Su.) Gilbertson

206A. Diseases of Fruit, Nut, and Vine Crops (3) Lecture—2 hours; laboratory—6 hours. Prerequisite: course 120; Plant Biology 119. Course 205 may be taken concurrently. Clinical study of fruit, nut, and vine crops diseases with emphasis on etiology, epidemiology, diagnosis, and control. (Deferred grading only, pending completion of sequence.)—Offered in alternate years.—S. (S.) Kirkpatrick

206B. Diseases of Fruit, Nut, and Vine Crops (1) Lecture—2 hours; laboratory—6 hours. Prerequisite: course 120; Plant Biology 119. Course 205 may be taken concurrently. Clinical study of fruit, nut, and vine crops diseases with emphasis on etiology, epidemiology, diagnosis, and control. (Deferred grading only, pending completion of sequence.)—Su. (Su.)

217. Molecular Genetics of Fungi (3) Lecture—3 hours. Prerequisite: graduate standing in a biological science, Biological Sciences 101, 103, Molecular and Cellular Biology 161; Plant Biology 119; courses 130, 215X; Microbiology 215 recommended. Advanced treatment of molecular biology and genetics of filamentous fungi and yeasts, including gene structure, organization and regulation; plant pathogenesis; secretion; control of reproduction; molecular evolution; transformation; and gene manipulation. (Same course as Biological Chemistry 217.) Offered in alternate years.—F.

224. Advanced Mycology (4) Lecture—2 hours; laboratory—6 hours. Prerequisite: course 148 or Plant Biology 148 or consent of instructor. Systematics, evolution, and ecology of the fungi. Topics include modern techniques and theories of classification of fungi, species concepts, sexual compatibility and vegetative compatibility. Laboratories emphasize various approaches to fungal identification. Offered in alternate years.—S. Epstein, Rizzo

228. Plant Bacteriology (5) Lecture—2 hours; laboratory—9 hours. Prerequisite: course 120; Microbiology 2 or the equivalent; Biological Sciences 102, 103. Study of bacteria which have a saprophytic, symbiotic, or parasitic association with higher and lower plants. Clinical and molecular methods for identification and classification of these bacteria. Offered in alternate years.—F. (F.) Bostock, Gilbertson

230. Plant Virology (3) Lecture—3 hours. Prerequisite: upper division or graduate course in molecular biology or graduate student in plant pathology. Viruses as causal agents of plant diseases and as tools for manipulating plants; structures of virus particles; mechanisms of transmission, replication, and spread in the plant; cytokin and molecular biology in susceptible and resistant reactions to viral and virus disease control. Only 2 units of credit to students who have completed Microbiology 262. Not open for credit to students who have completed course 226. Offered in alternate years.—W. Bruning, Falk


290C. Advanced Research Conference (1) Seminar—1 hour. Prerequisite: course 120 or consent of instructor. Presentation, evaluation, and critical discussions of research activities in the area of advanced plant pathology; primarily designed for graduate students. (S/U grading only.)—F, W, S. (F, W, S.)
Plant Physiology

See Plant Biology, on page 509; and Plant Biology (A Graduate Group), on page 511.

Plant Sciences

[College of Agricultural and Environmental Sciences]

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Faculty

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Trevor V. Suslow, Ph.D., Lecturer, Postharvest Horticulturist and Specialist in Cooperative Extension

Allen Van Denyze, Ph.D., Lecturer and Researcher

Major Programs. See Biotechnology, on page 196, Ecological Management and Restoration, on page 250, Environmental Horticulture and Urban Forestry, on page 324.

Related Courses. See the Biotechnology, Environmental Horticulture, and Agronomy, and Plant Biology course listings.

Graduate Study. For related graduate study, see the M.S. degree program in International Agricultural Development, and the Ph.D. degree programs in the graduate groups of Horticulture and Agronomy, Plant Biology, Ecology, Genetics, Geography, and Soils and Biogeochmistry. See also Graduate Studies, on page 120.

The Major Program

The Plant Sciences major is designed for students who are interested in a scientific understanding of how plants grow and develop in managed agricultural ecosystems and how plant products are utilized for food, fiber and environmental enhancement. Advances in science and technology have provided new insights and options for using plants to address the issues associated with providing renewable food, fiber and energy resources for a growing world population while minimizing adverse impacts on the natural environment. Graduates in Plant Sciences are able to apply their skills and knowledge to a diverse range of agricultural and environmental goals or pursue advanced degrees in plant sciences.

The Program. The curriculum provides depth in the biological and physical sciences and a sound understanding of how plants obtain and utilize resources from their environment to sustain their growth and development. The influences of genetics, management systems and environmental inputs on crop development and productivity are emphasized along with the postharvest preservation and marketing of plant products. Students will develop an area of specialization with options in Crop Production,