In the Department of Agricultural Biology we study plants, microbes, and insects in order to describe their roles in agricultural and natural ecosystems. We are motivated by new discoveries and we share this knowledge with others so that we can all work together to improve ecosystem health and sustainability.

Office in Plant Sciences Building, Room C129
(970) 491-5261
agbio.agsci.colostate.edu (https://agbio.agsci.colostate.edu/)
Professor Amy Charkowski, Head
Janet Dill, Graduate Coordinator
Chris Amerman, Undergraduate Academic Success Coordinator

Undergraduate Majors
- Agricultural Biology (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/agricultural-biology-major/)
- Entomology Concentration (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/entomology-concentration/)
- Plant Pathology Concentration (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/plant-pathology-concentration/)
- Weed Science Concentration (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/weed-science-concentration/)

Minors
Minors are offered in Entomology and Plant Health. Students are provided with maximum breadth and depth with a limited number of required courses. The minors also serve to broaden the academic background of students seeking employment in the interdisciplinary job markets associated with most plant science majors. The minors provide adequate credits to meet most federal and state certification requirements for employment. Please contact Dr. Kondratieff for information on the entomology minor and Janet Dill for the plant health minor.
- Entomology (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/entomology-minor/)
- Plant Health (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/plant-health-minor/)

Graduate Programs in Bioagricultural Sciences
The department offers graduate programs leading to Master of Science and Doctor of Philosophy degrees in Bioagricultural Sciences, with specializations available in Entomology, Pest Management, Plant Pathology, and Weed Science.

Research in the department is focused in four areas of emphasis that cut across disciplinary specializations:
1. genomics and molecular biology;
2. ecology and biodiversity;
3. biology and management of invasive species; and
4. integrated pest management.

In addition, a number of faculty in the department are members of CSU’s Graduate Degree Program in Ecology or the Cell and Molecular Biology Program and advise M.S. and Ph.D. students through these programs. Students interested in graduate work should refer to the Graduate and Professional Bulletin (http://catalog.colostate.edu/general-catalog/graduate-bulletin/) or visit the Department of Agricultural Biology. (https://agbio.agsci.colostate.edu/)

Master’s Programs
- Master of Science in Bioagricultural Sciences (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/ms-bioagricultural-sciences/)
- Master of Science in Bioagricultural Sciences, Plan A, Entomology Specialization (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/ms-bioagricultural-sciences/entomology-specialization-plan-a/)
- Master of Science in Bioagricultural Sciences, Plan B, Pest Management Specialization (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/ms-bioagricultural-sciences/pest-management-specialization-plan-b/)
- Master of Science in Bioagricultural Sciences, Plan A, Plant Pathology Specialization (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/ms-bioagricultural-sciences/plant-pathology-specialization-plan-a/)
- Master of Science in Bioagricultural Sciences, Plan A, Weed Science Specialization (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/ms-bioagricultural-sciences/weed-science-specialization-plan-a/)

Ph.D.
- Ph.D. in Bioagricultural Sciences (http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-biology/bioagricultural-sciences-phd/)
Courses

Subjects in this department include: Agricultural Biology (AB) and Bioagricultural Sciences and Pest Management (BSPM)

Agricultural Biology (AB)

AB 120 Agricultural Biology--Freshman Orientation Credit: 1 (1-0-0)
Course Description: Introduction to information and skills necessary to succeed in the agricultural biology major.
Prerequisite: None.
Restriction: Must be a: Undergraduate.
Registration Information: This is a partial semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

AB 130 Working with Agricultural Biology Data Credit: 1 (1-0-0)
Course Description: Introduction to the scientific method and systems thinking in terms of agricultural biology. Develop a hypothesis based on field observations, collect and analyze data to determine if findings align with the hypothesis. Results are communicated in a written report, and oral presentation.
Prerequisite: AB 120, may be taken concurrently.
Restriction: Must be a: Undergraduate.
Registration Information: This is a partial semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

AB 230 Becoming an Agricultural Biology Professional Credit: 1 (1-0-0)
Course Description: Design professional resumes, and develop interpersonal skills to succeed in a professional environment. Develop criteria to write a report from internships, and develop skills in interpretation of qualitative and quantitative agricultural biology data.
Prerequisite: AB 130.
Registration Information: Agricultural biology majors only. This is a partial semester course. Credit not allowed for both AB 230 and AB 270.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

AB 270 Agri. Biology Orientation for Transfers Credits: 2 (2-0-0)
Course Description: Introduction to the scientific method and systems thinking in terms of agricultural biology. Develop a hypothesis based on field observations, collect and analyze data. Prepare to become agricultural biology professionals by designing resumes and practicing skills to succeed in a professional environment.
Prerequisite: None.
Registration Information: Agricultural biology majors only. Written consent of instructor. Credit not allowed for both AB 230 and AB 270.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

AB 310 Understanding Pesticides Credits: 3 (3-0-0)
Course Description: Identification, properties, use, labeling, environmental interactions, and application of major classes of pesticides.
Prerequisite: BZ 100 to 199 - at least 3 credits or CHEM 100 to 199 - at least 3 credits.
Registration Information: Junior standing. Sections may be offered: Online. Credit not allowed for both AB 310 and BSPM 310.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

AB 330 Applications in Agricultural Biology I Credits: 2 (2-0-0)
Course Description: Knowledge, skills, and abilities to propose sustainable solutions to biological problems in natural or managed ecosystems. Collectively discuss a diverse set of case studies that incorporate systems approach in solving agricultural biology issues. Hone career plans and professional skills.
Prerequisite: (AB 230 or AB 270) and (BSPM 302).
Restriction: Must be a: Undergraduate.
Registration Information: Agricultural biology majors only.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

AB 340 Insect Biotechnology Credits: 3 (3-0-0)
Course Description: Introduction to concepts, terminology, and applications of molecular biology techniques as it relates to the entomology. Learn about the use of whole insects, as well as their cells, tissues, and associated bacteria in medical, pharmaceutical, and agricultural applications.
Prerequisite: LIFE 102.
Registration Information: Credit not allowed for both AB 340 and BSPM 280A1.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

AB 430 Applications in Agricultural Biology II Credits: 3 (3-0-0)
Course Description: Apply systems thinking and dynamic systems modeling to case studies and a capstone project that poses sustainable solutions to biological problems in natural or managed ecosystems. Hone career plans and professional skills.
Prerequisite: AB 330.
Restriction: Must be a: Undergraduate.
Registration Information: Agricultural biology majors only.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
AB 509 Herbicide Selectivity and Action Credits: 3 (3-0-0)
Course Description: Explores the physicochemical properties of herbicides, their selectivity (through placement and metabolism), their mechanism of action, uses in weed management, visual symptoms of herbicide treatment, how plants can evolve resistance to these compounds, and controversial topics related to the use of herbicides.
Prerequisite: None.
Registration Information: Sections may be offered: Online.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

AB 511 Microbiome of Plant Systems Credits: 3 (3-0-0)
Course Description: Emphasizes interdisciplinary and cross curricular education with training in disciplines that support an increased understanding of plant associated microbiome and their optimization.
Prerequisite: None.
Restriction: Must be a: Graduate.
Registration Information: Graduate standing. Sections may be offered: Online. Credit not allowed for both BSPM 102 and BSPM 356A.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

AB 515 Plant Biochemistry in Agriculture Credits: 3 (3-0-0)
Course Description: Experiential learning environment leading to mastery of principles of protein homology modeling, metabolic network analysis, and important plant biochemical pathways. Structure and function of enzymes in metabolic pathways and the contributions of these pathways to plant growth and development.
Prerequisite: HORT 576.
Restriction: Must be a: Graduate.
Registration Information: Graduate standing. Sections may be offered: Online. Credit allowed for only one of the following: AB 515, BSPM 515 or BSPM 581A2.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

AB 529 Pesticide Resistance Evolution and Management Credits: 3 (3-0-0)
Course Description: Examines pesticide resistance, including principles of resistance evolution; resistance mechanisms in arthropods, weeds, and plant pathogens; management approaches; communication strategies; and new developments in technology for pest management, including RNAi and gene drive.
Prerequisite: (LIFE 102 or LIFE 103) and (BZ 346 or SOCR 330).
Registration Information: Sections may be offered: Online. Credit not allowed for both AB 529 and BSPM 580A4.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

Bioagricultural Sciences and Pest Management (BSPM)

BSPM 102 Insects, Science, and Society (GT-SC2) Credits: 3 (3-0-0)
Course Description: How insects develop, behave, and affect human activity. What every student should know about the most diverse life form on Earth.
Prerequisite: None.
Registration Information: Credit not allowed for both BSPM 102 and BSPM 356A.
Term Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 201 Weed Management and Control Credits: 3 (3-0-0)
Course Description: Basic overview of weeds and weed control.
Prerequisite: None.
Registration Information: Offered as an online course only.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 300 Topics in Livestock Entomology Credit: 1 (1-0-0)
Also Offered As: ANEQ 300B.
Course Description: Identification, biology, and management of insect, tick, and mite pests.
Prerequisite: BZ 100 to 199 between 3 and 5 credits - at least 3 credits or LIFE 100 to 199 between 3 and 5 credits - at least 3 credits.
Registration Information: Credit not allowed for both BSPM 300 and ANEQ 300B.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 302 Applied and General Entomology Credits: 2 (2-0-0)
Course Description: Biology and management of insects.
Prerequisite: None.
Registration Information: Credit not allowed for both BSPM 302 and BSPM 356A.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

BSPM 303A Entomology Laboratory: General Credits: 2 (0-4-0)
Course Description: Biology and recognition of insects.
Prerequisite: BSPM 302, may be taken concurrently.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

BSPM 303B Entomology Laboratory: Horticultural Credit: 1 (0-2-0)
Course Description: Biology and recognition of insects.
Prerequisite: BSPM 302, may be taken concurrently.
Registration Information: Credit not allowed for both BSPM 303B and BSPM 356A.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
BSPM 303C Entomology Laboratory: Agricultural Credit: 1 (0-2-0)
Course Description: Biology and recognition of insects.
Prerequisite: BSPM 302, may be taken concurrently.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 308 Ecology and Management of Weeds Credits: 3 (2-3-0)
Course Description: Classification, characteristics; weed biology and ecology; control by cultural, mechanical, chemical, and biological means; successional management.
Prerequisite: (BZ 120 or LIFE 103) and (CHEM 107 or CHEM 111).
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 355A Horticulture Pathology: General Pathology Credit: 1 (1-0-0)
Course Description: A 5-week course consisting of General Plant Pathology; identification of the organisms that can cause plant diseases.
Prerequisite: HORT 100 to 199 or LIFE 100 to 199.
Registration Information: Written consent of instructor. This is a partial semester course. Offered as an online course only. Credit not allowed for both BSPM 355A and BSPM 381A2.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 355B Hort Pathology: Turf and Ornamental Disease Credit: 1 (1-0-0)
Course Description: Turf and ornamental plant diseases, their management and control.
Prerequisite: BSPM 355A.
Registration Information: Written consent of instructor. This is a partial semester course. Offered as an online course only. Credit not allowed for both BSPM 355B and BSPM 361.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 355C Horticulture Pathology: Vegetable and Greenhouse Disease Credit: 1 (1-0-0)
Course Description: Diseases in the Greenhouse and Vegetable crops, management and control.
Prerequisite: BSPM 355A.
Registration Information: Offered as an online course only. This is a partial semester course. Written consent of instructor.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 356A Horticultural Entomology Introduction Credit: 1 (1-0-0)
Course Description: Basic biology, identification and management of insects and mites affecting horticultural crops.
Prerequisite: HORT 100 to 199 or LIFE 100 to 199.
Registration Information: Written consent of instructor. This is a partial semester course. Offered as an online course only. Credit not allowed for both BSPM 302 and BSPM 356A. Credit not allowed for both BSPM 302 and BSPM 356A. Credit not allowed for both BSPM 302 and BSPM 356A.
Term Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 356B Horticultural Entomology: Food Crops Credit: 1 (1-0-0)
Course Description: Insect and mite pests of fruits, vegetables and other garden grown food crops.
Prerequisite: BSPM 102 or BSPM 302 or BSPM 356A, may be taken concurrently.
Registration Information: This is a partial semester course. Offered as an online course only.
Term Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 356C Horticultural Entomology: Landscape Plants Credit: 1 (1-0-0)
Course Description: Insect and mite pests of ornamentals (woody plants, flowers) and turfgrass and their management.
Prerequisite: BSPM 102 or BSPM 302 or BSPM 356A, may be taken concurrently.
Registration Information: Written consent of instructor. This is a partial semester course. Offered as an online course only.
Term Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

BSPM 361 Elements of Plant Pathology Credits: 3 (2-2-0)
Course Description: Diseases of economic plants.
Prerequisite: BZ 104 or BZ 120 or HORT 100 or LIFE 102.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

BSPM 365 Integrated Tree Health Management Credits: 4 (3-3-0)
Course Description: Insects and diseases in forest and urban ecosystems. Effects, diagnosis, prevention, and interactions.
Prerequisite: BZ 120 or LIFE 102.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

BSPM 384 Supervised College Teaching Credits: Var[1-3] (0-0-0)
Course Description: None.
Prerequisite: None.
Registration Information: A maximum of 10 combined credits for all 384 and 484 courses are counted towards graduation requirements.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 415 Pollinator Management in Agroecosystems Credits: 2 (2-0-0) Also Offered As: SOCR 415.
Course Description: Fundamental concepts of pollinator biology and management, sustainable crop-pollinator interactions, regional and global issues on pollinator management and conservation, best management practices for commercially managed pollinators.
Prerequisite: HORT 100 or SOCR 100.
Registration Information: Junior standing. Credit not allowed for both SOCR 415 and BSPM 415. Required field trips.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.
BSPM 423 Evolution and Classification of Insects Credits: 3 (1-4-0)
Course Description: Major groups of insects, living and fossil; major evolutionary trends in structure and behavior.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory. Credit not allowed for both BSPM 423 and BSPM 523.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 424 Principles of Systematic Zoology Credits: 3 (3-0-0)
Also Offered As: BZ 424.
Course Description: Principles and methods of classification, zoological nomenclature, taxonomic decisions regarding species and higher categories.
Prerequisite: BZ 111 and BZ 110 or LIFE 103.
Registration Information: Credit not allowed for both BSPM 424 and BZ 424.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: Yes.

BSPM 445 Aquatic Insects Credits: 4 (2-4-0)
Course Description: Biology and recognition of major orders and families of aquatic insects; a collection is required.
Prerequisite: BZ 111 or LIFE 103.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

BSPM 450 Molecular Plant-Microbe Interaction Credits: 3 (3-0-0)
Course Description: Principles of plant-microbe/insect interactions, physiological and molecular aspects of plant defense, genomics approaches to study plant defense.
Prerequisite: (BZ 100 to 499 - at least 3 credits) and (BZ 346 or SOCR 330).
Registration Information: Credit not allowed for both BSPM 450 and BSPM 550.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 451 Integrated Pest Management Credits: 3 (3-0-0)
Course Description: Concepts of integrated pest management and the strategies and tactics employed in the application of these concepts.
Prerequisite: BSPM 302 or BSPM 308 or BSPM 361.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 462 Parasitology and Vector Biology Credits: 5 (3-4-0)
Also Offered As: BZ 462 and MIP 462.
Course Description: Protozoa, helminths, and insects and related arthropods of medical importance; systematics, epidemiology, host damage and control.
Prerequisite: (BZ 110 or LIFE 103) and (BZ 212 or LIFE 206 or MIP 302).
Registration Information: Must register for lecture and laboratory. Credit allowed for only one of the following: BSPM 462, BZ 462, MIP 462.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 465 Aquatic Insects Credits: 4 (2-4-0)
Course Description: Biology and recognition of major orders and families of aquatic insects; a collection is required.
Prerequisite: BZ 111 or LIFE 103.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

BSPM 487 Internship Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 492 Seminar Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 495 Independent Study Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 496 Group Study Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 500 Foundations of Bioagricultural Sciences Credits: 2 (2-0-0)
Course Description: Introduction to graduate school covering managing time, advisor and research, plus a survey of topics encompassed by the department of BSPM.
Prerequisite: None.
Restriction: Must be a: Graduate.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 502A Topics in Plant Pathology: Plant Viruses Credit: 1 (1-0-0)
Course Description:
Prerequisite: BIO 300 to 499 - at least 3 credits or BSPM 300 to 499 - at least 3 credits or BZ 300 to 499 - at least 3 credits or LIFE 300 to 499 - at least 3 credits.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 502B Topics in Plant Pathology: Plant Bacteriology Credit: 1 (1-0-0)
Course Description:
Prerequisite: BIO 300 to 499 - at least 3 credits or BSPM 300 to 499 - at least 3 credits or BZ 300 to 499 - at least 3 credits or LIFE 300 to 499 - at least 3 credits.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 502F Topics in Plant Pathology: Plant Disease Epidemiology Credit: 1 (1-0-0)
Course Description:
Prerequisite: BSPM 361.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.
BSPM 507  Insect Behavior  Credits: 3 (3-0-0)
Course Description: Behavior of insects and related arthropods with special attention to social behavior.
Prerequisite: None.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 508  Environmental Fate of Pesticides  Credits: 3 (3-0-0)
Course Description: Processes that affect fate of pesticides and their metabolites in the environment with emphasis on soil and water.
Prerequisite: BZ 440 or CHEM 245 or SOCR 240.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 510  Insect-Plant Disease Relationships  Credits: 3 (3-0-0)
Course Description: Relationships between insects and various plant pathogens as they affect survival and transmissions of pathogens.
Prerequisite: BSPM 302 or BSPM 361.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 520  Advanced Systematics  Credits: 3 (3-0-0)
Also Offered As: BZ 520.
Course Description: Theory and practice of modern systematics.
Prerequisite: BSPM 424 or BZ 424 or BZ 325.
Registration Information: Credit not allowed for both BSPM 520 and BZ 520.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 521  Forest Health Issues  Credits: 3 (3-0-0)
Course Description: Current topics related to forest and shade tree health from ecosystems to tree defense physiology.
Prerequisite: None.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 523  Advanced Evolution/Classification of Insects  Credits: 4 (1-4-1)
Course Description: Major groups of insects, living and fossil; major evolutionary trends in structure and behavior.
Prerequisite: None.
Registration Information: Must register for lecture, laboratory, and recitation. Credit not allowed for both BSPM 523 and BSPM 423.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 525  Insect Physiology  Credits: 3 (3-0-0)
Course Description: Principles of insect function.
Prerequisite: BSPM 302.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 526  Evolutionary Ecology  Credits: 3 (3-0-0)
Also Offered As: BZ 526.
Course Description: Adaptation to abiotic and biotic environments; how current ecological processes interact with evolutionary history.
Prerequisite: LIFE 320 or LIFE 220 or LAND 220.
Registration Information: Credit not allowed for both BSPM 526 and BZ 526.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 528  Invasive Plants/Weeds–Ecosystems to Molecules  Credits: 3 (3-0-0)
Course Description: Contributions of disciplines of weed science and invasion ecology to understanding the biology, ecology and management of "problem plants."
Prerequisite: (LIFE 320 or LAND 220 or LIFE 220) and (BZ 120) and (LIFE 102 or LIFE 103).
Term Offered: Spring (even years).
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

BSPM 530  Scientific Writing  Credit: 1 (1-0-0)
Also Offered As: SOCR 530.
Course Description: Skills necessary to prepare complete scientific journal articles including writing, editing, and literature searching and assessment.
Prerequisite: None.
Registration Information: Credit not allowed for both BSPM 530 and SOCR 530.
Term Offered: Spring.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 540  Understanding Genomes  Credits: 3 (3-0-0)
Course Description: Harnessing genome information and related -omics level technologies for use in answering biological questions.
Prerequisite: None.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 550  Molecular Plant-Microbe Interactions  Credits: 3 (3-0-0)
Course Description: Principles of plant-microbe interactions, physiological and molecular aspects of plant defense, genomic approaches to study plant defense.
Prerequisite: (BZ 100 to 499 - at least 3 credits) and (BZ 346 or SOCR 330).
Registration Information: Credit not allowed for both BSPM 550 and BSPM 450.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 551  Advanced Integrated Pest Management  Credits: 4 (3-0-1)
Course Description: Concepts of integrated pest management and the strategies and tactics employed in the practical application of these concepts.
Prerequisite: BSPM 302 or BSPM 308 or BSPM 361.
Registration Information: Must register for lecture and recitation.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.
BSPM 555 Immature Insects Credits: 3 (1-4-0)  
**Course Description:** Characteristics of immature forms of orders and families of insects emphasizing those important to man.  
**Prerequisite:** BSPM 303A or BSPM 303B or BSPM 303C.  
**Registration Information:** Must register for lecture and laboratory.  
**Term Offered:** Spring (odd years).  
**Grade Mode:** Traditional.  
**Special Course Fee:** No.

BSPM 556 Biological Control of Plant Pests Credits: 3 (3-0-0)  
**Course Description:** Management of insect pests of plants and weeds using biological control agents such as insects, bacteria, viruses, and fungi.  
**Prerequisite:** (BZ 120 or LIFE 103) and (LIFE 320 or LAND 220 or LIFE 220).  
**Term Offered:** Fall (even years).  
**Grade Mode:** Traditional.  
**Special Course Fee:** No.

BSPM 570 Chemical Ecology Credits: 3 (3-0-0)  
**Course Description:** Chemical interactions among animals, plants, fungi, and microorganisms.  
**Term Offered:** Spring (even years).  
**Grade Mode:** Traditional.  
**Special Course Fee:** No.

BSPM 571 Techniques in Chemical Ecology Credit: 1 (0-2-0)  
**Course Description:** Practical experience with chemical techniques for separation, analysis, and synthesis of natural products together with biological assays for activity.  
**Term Offered:** Spring (odd years).  
**Grade Mode:** Traditional.  
**Special Course Fee:** No.

BSPM 575 Molecular and Genomic Evolution Credits: 3 (3-0-0)  
**Also Offered As:** CM 710.  
**Course Description:** Genetic manipulation of bacteria, bacteriophage, and yeast including experiments in molecular cloning and gene expression.  
**Prerequisite:** BC 463 or BZ 346 or BZ 350 or CM 501 or CS 155 or ERHS 332 or MIP 275 or MIP 300 or MIP 450 or STAT 307 or ERHS 307.  
**Restriction:** Must be a: Graduate, Professional.  
**Registration Information:** Must register for laboratory and recitation.  
**Term Offered:** Fall, Spring.  
**Grade Mode:** Instructor Option.  
**Special Course Fee:** No.

BSPM 576 Bioinformatics Credits: 3 (3-0-0)  
**Also Offered As:** MIP 576.  
**Course Description:** Technical computing across platforms using bioinformatics tools in molecular analysis.  
**Prerequisite:** BC 463 or BZ 310 or BZ 350 or CM 501 or CS 155 or ERHS 332 or MIP 275 or MIP 300 or MIP 450 or STAT 307 or ERHS 307.  
**Restriction:** Must be a: Graduate, Professional.  
**Registration Information:** Must register for laboratory and recitation.  
**Term Offered:** Fall, Spring.  
**Grade Mode:** Traditional.  
**Special Course Fee:** No.

BSPM 584 Supervised College Teaching Credits: Var[1-3] (0-0-0)  
**Course Description:**  
**Prerequisite:** None.  
**Terms Offered:** Fall, Spring, Summer.  
**Grade Mode:** Instructor Option.  
**Special Course Fee:** No.

BSPM 585 Internship Credits: Var[1-18] (0-0-0)  
**Course Description:**  
**Restriction:** Must be a: Graduate, Professional.  
**Terms Offered:** Fall, Spring.  
**Grade Mode:** Instructor Option.  
**Special Course Fee:** No.

BSPM 587 Seminar Credits: Var[1-3] (0-0-0)  
**Course Description:** Major questions and theory pertinent to understanding current and relevant science topics.  
**Prerequisite:** None.  
**Term Offered:** Fall, Spring.  
**Grade Mode:** Instructor Option.  
**Special Course Fee:** No.

BSPM 592 Independent Study Credits: Var[1-3] (0-0-0)  
**Course Description:**  
**Prerequisite:** None.  
**Term Offered:** Fall, Spring.  
**Grade Mode:** Instructor Option.  
**Special Course Fee:** No.

BSPM 594 Group Study Credits: Var[1-3] (0-0-0)  
**Course Description:**  
**Prerequisite:** None.  
**Term Offered:** Fall, Spring.  
**Grade Mode:** Instructor Option.  
**Special Course Fee:** No.

BSPM 596 Research Credits: Var[1-18] (0-0-0)  
**Course Description:**  
**Restriction:** Must be a: Graduate, Professional.  
**Terms Offered:** Fall, Spring, Summer.  
**Grade Mode:** Instructor Option.  
**Special Course Fee:** No.

BSPM 698 Thesis Credits: Var[1-18] (0-0-0)  
**Course Description:**  
**Restriction:** Must be a: Graduate, Professional.  
**Terms Offered:** Fall, Spring.  
**Grade Mode:** Instructor Option.  
**Special Course Fee:** No.

BSPM 710 Techniques in Molecular Biology and Genetics Credits: 3 (0-4-1)  
**Also Offered As:** CM 710.  
**Course Description:** Genetic manipulation of bacteria, bacteriophage, and yeast including experiments in molecular cloning and gene expression.  
**Prerequisite:** BC 463 or BZ 346 or BZ 350 or MIP 450 or SOCR 330.  
**Restriction:** Must be a: Graduate, Professional.  
**Registration Information:** Must register for laboratory and recitation.  
**Term Offered:** Spring.  
**Grade Mode:** Traditional.  
**Special Course Fee:** No.
BSPM 740  Plant Molecular Genetics  Credits: 3 (3-0-0)
Also Offered As: SOCR 740.
Course Description: Advances in study of organization and function of nuclear and organelar genomes, gene expression in higher plants, and plant-microbe interactions.
Prerequisite: BC 351 and SOCR 330.
Restriction: Must be a: Graduate, Professional.
Registration Information: Credit not allowed for both BSPM 740 and SOCR 740.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BSPM 784  Supervised College Teaching  Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 787  Internship  Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 792  Seminar  Credits: Var[1-2] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 794  Independent Study  Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 798  Research  Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 799  Dissertation  Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.