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 or visit the Department of Bioagricultural Sciences and Pest Management (http://bspm.agsci.colostate.edu).

Master’s Programs

- Master of Science in Bioagricultural Sciences
- Master of Science in Bioagricultural Sciences, Plan A, Entomology Specialization
- Master of Science in Bioagricultural Sciences, Plan B, Pest Management Specialization
- Master of Science in Bioagricultural Sciences, Plan A, Plant Pathology Specialization
- Master of Science in Bioagricultural Sciences, Plan A, Weed Science Specialization

Ph.D.

- Ph.D. in Bioagricultural Sciences
- Ph.D. in Bioagricultural Sciences, Entomology Specialization
- Ph.D. in Bioagricultural Sciences, Plant Pathology Specialization
- Ph.D. in Bioagricultural Sciences, Weed Science Specialization

Courses

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.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.
Additional Information: Biological & Physical Sciences 3A, Natural & Physical Sciences w/o lab (GT-SC2).

BSPM 201  Weed Management and Control Credits: 3 (0-0-3)
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.
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: No.

BSPM 303B  Entomology Laboratory: Horticultural  Credit: 1 (0-2-0)
Course Description: Biology and recognition of insects.
Prerequisite: BSPM 302, may be taken concurrently.
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 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.
Term Offered: Spring (even years).
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: BZ 104 or BZ 120 or HORT 100 or LIFE 102.
Registration Information: Written consent of instructor. This is a partial semester course. Offered as an online course only.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

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.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

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: 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: No.

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 452  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 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 (odd 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 509 Herbicide Selectivity and Action Credits: 3 (3-0-0)  
Course Description: Selectivity of major photosynthetic and growth inhibitor herbicides based on herbicide transport, metabolism, and mode of action.  
Prerequisite: BSPM 308 or BZ 440.  
Term Offered: Fall (even 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.
Prerequisite: None.
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.
Prerequisite: None.
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: BZ 575.
Course Description: Molecular, biological mechanisms of evolutionary change: mutation; selection; gene expression/regulation; changes in whole-genome architecture.
Prerequisite: BZ 220 and BZ 350.
Registration Information: Credit not allowed for both BSPM 575 and BZ 575.
Term Offered: Spring (even years).
Grade Mode: Traditional.
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.
Registration Information: Credit not allowed for both BSPM 576 and MIP 576.
Terms 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 587  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 592  Seminar  Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring.
Grade Mode: Instructor Option.
Special Course Fee: No.

BSPM 594  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 596  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 598  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 599  Thesis  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 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. Credit not allowed for both BSPM 710 and CM 710.
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 organellar 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.