

# AGRICULTURAL BIOLOGY-AB (AB)

## Courses

**AB 111 Feeding the World in a Changing Climate (GT-SC2) Credits: 3 (3-0-0)**

**Course Description:** Fundamental concepts of climate change and implications for agriculture and global food security.

**Prerequisite:** None.

**Registration Information:** Sections may be offered: Online.

**Terms Offered:** Fall, Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**Additional Information:** Biological & Physical Sciences 3A, Natural & Physical Sciences w/o lab (GT-SC2).

**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 303 General Entomology Laboratory Credits: 2 (0-4-0)**

**Course Description:** Topics in insect biology and morphology, with the primary goal of learning how to identify arthropods. This process includes hands-on exercises and field trips and is mostly dedicated to practicing the identification of insect specimens using microscopes and dichotomous keys. A student-proposed project with an included research paper allows students to more deeply explore an aspect of Entomology of interest.

**Prerequisite:** BSPM 302, may be taken concurrently.

**Registration Information:** Required field trips. Sections may be offered: Online. Credit not allowed for both AB 303 and BSPM 303A.

**Terms Offered:** Fall, Summer.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**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:** Spring.

**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 377 Geographic Information Systems in Agriculture Credits: 3 (2-2-0)**

**Also Offered As:** SOCR 377.

**Course Description:** Geospatial science, remote sensing, and GPS technology play a central role in precision and digital agriculture. Designed to introduce the concepts of integrating knowledge in biology, statistics, and economics with advanced geospatial science, especially GPS, GIS, remote sensing, and spatial statistics, for agricultural applications.

**Prerequisite:** CS 100 to 499 - at least 3 credits or SOCR 100 to 499 - at least 3 credits or STAT 100 to 499 - at least 3 credits.

**Restriction:** Must not be a: Freshman.

**Registration Information:** Must register for lecture and laboratory. Required field trips. Credit allowed for only one of the following: AB 377, SOCR 377, or SOCR 577.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 410 Understanding Pesticides Credits: 3 (3-0-0)**

**Course Description:** Explore the safe and effective use of pesticides, balancing improved pest management and production while minimizing harm to humans and the environment. Analyze pesticide labels to identify procedures for using the pesticide safely, effectively, and legally. Use objective sources of pesticide information to improve pesticide use decision making and to communicate effectively about the risks and benefits of pesticides.

**Prerequisite:** BZ 100 to 199 - at least 3 credits or CHEM 100 to 199 - at least 3 credits.

**Restriction:** Must not be a: Freshman, Sophomore.

**Registration Information:** Junior standing. Sections may be offered: Online. Credit allowed for only one of the following: AB 310, AB 410, or BSPM 310.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 415 Agricultural Data Science Credits: 3 (3-0-0)**

**Course Description:** Agricultural data science to facilitate decision making, accelerate training, use resources efficiently, predict pests and diseases, mitigate the impacts of and adapt to climate change, reduce labor expenses, improve safety, manage supply chains, and understand consumer preferences. Designed for students in the agricultural sciences who wish to learn about data science and its applications in agriculture.

**Prerequisite:** (AB 120 or AB 130 or LIFE 103 or LAND 220 or LIFE 220 or HORT 171 or SOCR 171) and (CS 152 or CS 150B or DSCI 235 or STAT 158).

**Restriction:** Must not be a: Freshman.

**Registration Information:** Sophomore standing. Sections may be offered: Online.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 420 Horticultural Entomology Credits: 2 (2-0-0)**

**Course Description:** Introduction to key pest arthropods associated with horticultural plants and integrated pest management (IPM) tactics focused on sustainable pest suppression, including a general entomology overview.

**Prerequisite:** BSPM 102 or BZ 120 or HORT 100 or LIFE 103.

**Registration Information:** This is a partial semester course. Sections may be offered: Online. Credit not allowed for both AB 420 and AB 480A1.

**Term Offered:** Fall.

**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 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:** AB 420 or BSPM 302 or BSPM 308 or BSPM 361.

**Registration Information:** Sections may be offered: Online.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 505 Exploring Colorado Agricultural Systems Credits: 2 (2-0-0)**

**Course Description:** Travel to all Colorado Agricultural Experiment Stations to gain hands-on experience in Colorado's major agricultural systems. Learn about the crops grown in each region, integrated pest management of each crop type, and production limitations, such as water, transportation, equipment, or labor. Engage with agricultural industry representatives and keep a journal of experiences.

**Prerequisite:** LIFE 102 or LIFE 103.

**Restriction:** Must not be a: Freshman, Sophomore, Junior.

**Registration Information:** Senior standing. Required field trips. Students must be available for each field trip over the course of the 4-week class. Credit not allowed for both AB 505 and AB 581A1.

**Term Offered:** Summer.

**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.

**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:** Spring (odd years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 521 Forest Health Issues Credits: 2 (2-0-0)**

**Course Description:** Current topics related to forest and shade tree health from ecosystems to tree defense physiology.

**Prerequisite:** BZ 120.

**Registration Information:** This is a partial semester course. Credit not allowed for both AB 521 and BSPM 521.

**Term Offered:** Fall (even years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 523 Advanced Evolution/Classification of Insects Credits: 5 (2-6-0)**

**Course Description:** Identification of major insect groups. Explore field collecting, specimen preservation methods, biodiversity discovery and description, patterns and timeline of insect evolution, classification, and morphology.

**Prerequisite:** BSPM 302 or BSPM 424.

**Restriction:** Must not be a: Freshman, Sophomore, Junior.

**Registration Information:** Senior standing. Must register for lecture and laboratory. Required field trips. Credit not allowed for both AB 523 and BSPM 523.

**Term Offered:** Fall (odd years).

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**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.

**AB 540 Insect Ecology Credits: 3 (2-0-1)**

**Also Offered As:** ECOL 540.

**Course Description:** Dynamics and regulation of insect populations, including predator-prey and host-parasite interactions, and pollination; insect diversity and declines, community structure and ecosystem services.

**Prerequisite:** BSPM 302 and LIFE 320.

**Restriction:** Must not be a: Freshman, Sophomore, Junior.

**Registration Information:** Senior standing. Must register for lecture and recitation. Credit allowed for only one of the following: AB 540, AB 581A2, ECOL 540, or ECOL 581A2.

**Term Offered:** Spring (odd years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 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:** AB 420 or BSPM 302 or BSPM 308 or BSPM 361.

**Registration Information:** Must register for lecture and recitation. Sections may be offered: Online.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 554 Biology of Fungal Plant Pathogens Credits: 2 (2-0-0)**

**Course Description:** Introduction to fungal biology, including ecology, physiology, genetics and diversity of fungal pathogens. Explore fungal lifecycles, modes and genetics of fungal mating and sources of genomic variation, and fungal pathogenesis.

**Prerequisite:** BSPM 361 or BSPM 365.

**Restriction:** Must not be a: Freshman, Sophomore, Junior.

**Registration Information:** Senior standing. This is a partial semester course. Credit not allowed for both AB 554 and AB 580A1.

**Term Offered:** Fall (odd years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 555 Topics in Plant Pathology--Plant Virology Credits: 2 (2-0-0)**

**Course Description:** Learn about the molecular mechanisms behind plant virus transmission, replication, translation, and movement, as well as the drivers for emerging plant viral diseases and methods of biotechnological control. Features that make viruses unique from other plant pathogens are the focus. The differences and similarities between plant viruses and viruses that infect other hosts (e.g. mammals and microbes) are also highlighted.

**Prerequisite:** (BSPM 361 or MIP 250 or MIP 300 or MIP 303) and (BZ 350).

**Restriction:** Must not be a: Freshman, Sophomore.

**Registration Information:** Junior standing. This is a partial semester course. Credit not allowed for both AB 555 and AB 580A2.

**Term Offered:** Fall (even years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 558 Current Topics in Molecular Plant Health Credits: 2 (0-0-2)**

**Course Description:** Plant-microbe communication, pathogen genomics, applications of biocontrol for invasive plant species and pests, molecular mechanisms for weedy adaptation to diverse environments, molecular mechanisms for insect resistance to pesticides, gene-editing applications, etc.

**Prerequisite:** LIFE 102.

**Restriction:** Must not be a: Freshman, Sophomore.

**Registration Information:** Junior standing. Offered as an online course only.

**Term Offered:** Spring.

**Grade Mode:** S/U Sat/Unsat Only.

**Special Course Fee:** No.

**AB 592 Seminar Credits: Var[1-2] (0-0-0)**

**Course Description:** Guest speakers giving lectures on a wide range of topics in agricultural sciences.

**Prerequisite:** None.

**Restriction:** Must be a: Graduate.

**Registration Information:** Graduate standing. Sections may be offered: Online. Credit not allowed for both AB 592 and BSPM 592.

**Terms Offered:** Fall, Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**AB 792 Seminar Credits: Var[1-2] (0-0-0)**

**Course Description:** Guest speakers giving lectures on a wide range of topics in agricultural sciences.

**Prerequisite:** None.

**Restriction:** Must be a: Graduate, Professional.

**Registration Information:** Sections may be offered: Online.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Traditional.

**Special Course Fee:** No.