AGRICULTURAL AND RESOURCE ECONOMICS (AREC) COURSES

AREC 224 Introduction to Agribusiness Entrepreneurship Credit: 1 (0-0-1)
Course Description: Introductory exposure to entrepreneurship for agribusinesses through presentations by industry professionals.
Prerequisite: AREC 202, may be taken concurrently or ECON 202, may be taken concurrently.
Registration Information: Required field trips. Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

AREC 305 Agricultural and Resource Enterprise Analysis Credits: 3 (2-2-0)
Course Description: Use of records in agricultural and resource enterprise management; analytical methods, budgets, and planning techniques for improved decision making.
Prerequisite: (**CIS 120** or **BUS 150** or **CS 110**) and (**AREC 202** or **ECON 202**).
Registration Information: Sections may be offered: Online. Must register for lecture and laboratory.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

AREC 328 Small Agribusiness Management Credits: 3 (3-0-0)
Course Description: Apply business principles to small food enterprises, agribusinesses and cooperatives.
Prerequisite: AREC 202 or ECON 202.
Registration Information: Sections may be offered: Online.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

AREC 405 Agricultural Production Management Credits: 3 (2-2-0)
Course Description: Economic principles of agricultural production decisions with linear programming analysis of production choices and farm planning.
Prerequisite: **AREC 305**.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

AREC 478 Agricultural Policy Credits: 3 (3-0-0)
Course Description: Formulation and administration of public policies affecting agricultural industries and rural areas in the United States.
Prerequisite: **AREC 202** or **ECON 202** or **AREC 240** or **ECON 240**.
Registration Information: Sections may be offered: Online.
Terms Offered: Fall, Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

BIOCHEMISTRY AND MOLECULAR BIOLOGY (BC)

BC 351 Principles of Biochemistry Credits: 4 (4-0-0)
Course Description: Structure and function of biological molecules; biocatalysis; metabolism and energy transduction; gene expression.
Prerequisite: (**BZ 110** or **BZ 120** or **LIFE 102**) and (**CHEM 245** or **CHEM 341** or **CHEM 345**).
Registration Information: For majors in biological sciences, engineering, and preprofessional students in the health sciences. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

BC 353 Pre-Health Genetics Credits: 4 (4-0-0)
Course Description: Applies and extends the biochemical concepts learned in **BC 351** to macromolecules and molecular processes based on nucleic acids.
Prerequisite: **BC 351**.
Registration Information: Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

BC 360 Responsible Conduct in Biochemical Research Credit: 1 (1-0-0)
Course Description: Research ethics and the responsible conduct of research.
Prerequisite: **CHEM 112**, may be taken concurrently and **LIFE 210**, may be taken concurrently.
Registration Information: Sophomore standing. Biochemistry majors only. This is a partial semester course.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BOTANY & ZOOLOGY (BZ) COURSES

BZ 110 Principles of Animal Biology (GT-SC2) Credits: 3 (3-0-0)
Course Description: General features (body form, physiology, life history, ecology) and evolutionary relationships of major phyla of animals.
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).

BZ 111 Animal Biology Laboratory (GT-SC1) Credit: 1 (0-3-0)

Course Description: Laboratory exercises demonstrating major features of animal biology and major phyla of animals.
Prerequisite: BZ 110, may be taken concurrently.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: Yes.
Additional Information: Biological & Physical Sciences 3A, Natural & Physical Sciences w/ lab (GT-SC1).

BZ 120 Principles of Plant Biology (GT-SC1) Credits: 4 (3-3-0)

Course Description: Diversity of relationships of plants and their structural and functional characteristics.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.
Additional Information: Biological & Physical Sciences 3A, Natural & Physical Sciences w/ lab (GT-SC1).

BZ 212 Animal Biology-Invertebrates Credits: 4 (3-3-0)

Course Description: General biology of invertebrates; their characteristics, classification, and adaptations.
Prerequisite: LIFE 103 or BZ 110 and BZ 111.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

BZ 214 Animal Biology-Vertebrates Credits: 4 (3-3-0)

Course Description: General biology of vertebrates; their characteristics, classification, and adaptations.
Prerequisite: BZ 111 and BZ 110 or LIFE 103.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

BZ 220 Introduction to Evolution Credits: 3 (3-0-0)

Course Description: Fundamental concepts in evolutionary biology.
Prerequisite: BZ 110 or BZ 120 or LIFE 103.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 223 Plant Identification Credits: 3 (2-2-0)

Course Description: Relationships and identification of flowering plants.
Prerequisite: BZ 120 or LIFE 103.
Registration Information: Must register for lecture and laboratory.
Terms Offered: Fall, Summer.
Grade Mode: Traditional.
Special Course Fee: Yes.

BZ 300 Animal Behavior Credits: 3 (3-0-0)

Course Description: Principles of ethology, behaviors of nonhuman animals emphasizing their adaptive significance and phylogenetic relationships.
Prerequisite: BZ 111 and BZ 110 or LIFE 103.
Terms Offered: Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 301 Animal Behavior Laboratory Credits: 2 (0-4-0)

Course Description: Laboratory experiments in animal behavior; demonstrations and independent investigations.
Prerequisite: BZ 300, may be taken concurrently.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 302 Poisonous Plants Credits: 3 (2-2-0)

Course Description: Identification and toxic properties of certain plants; animal reactions to more important ones.
Prerequisite: BZ 120 or LIFE 103.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 310 Cell Biology Credits: 4 (3-3-0)

Course Description: Structure and function of cells emphasizing molecular mechanisms. Communication, metabolism, motility, genetics, growth, and reproduction.
Prerequisite: (BZ 110 or BZ 120 or LIFE 103) and (CHEM 113).
Registration Information: Must register for lecture and laboratory.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: Yes.

BZ 311 Developmental Biology Credits: 4 (3-2-0)

Course Description: Developmental aspects of growth and differentiation stressed in higher plants and animals.
Prerequisite: BZ 310.
Registration Information: Must register for lecture and laboratory.
Terms Offered: Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: Yes.

BZ 321 Aquatic Vascular Plants Credits: 3 (1-4-0)

Course Description: Taxonomic relationships and identification of aquatic vascular plants.
Prerequisite: BZ 223 or BZ 325.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 325 Plant Systematics Credits: 4 (3-2-0)

Course Description: Principles and contemporary methods of classification of plants, and the application of modern phylogenetic theory in comparative biology.
Prerequisite: BZ 220.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 329 Herpetology Credits: 3 (2-2-0)

Course Description: Biology of amphibians and reptiles.
Prerequisite: BZ 110 and BZ 111 or LIFE 103.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 330 Mammalogy Credits: 3 (2-2-0)

Course Description: Evolution, classification, and biology of mammals; practice in identifying and preparing specimens.
Prerequisite: BZ 111 and BZ 110 or LIFE 103.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

BZ 331 Developmental Plant Anatomy Credits: 4 (2-4-0)

Course Description: Structure of plant cells, tissues, and organs as they develop.
Prerequisite: BZ 120 or LIFE 103.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 332 Introductory Phycology Credits: 4 (3-2-0)

Course Description: Evolution, diversity, ecology and global impact of algae.
Prerequisite: BZ 120 or LIFE 103.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 333 Introductory Mycology Credits: 4 (2-4-0)

Course Description: Groups of fungi including classification, structure, morphogenesis, phylogeny, and genetics and reproduction.
Prerequisite: BZ 120 or LIFE 103.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 335 Ornithology Credits: 3 (2-3-0)

Course Description: Biology of birds, especially behavior, ecology, and identification in the laboratory and field.
Prerequisite: BZ 111 and BZ 110 or LIFE 103.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Spring.

Grade Mode: Traditional.
Special Course Fee: Yes.

BZ 338 Comparative Morphology of Vascular Plants Credits: 4 (2-4-0)

Course Description: Origin, evolution, structure, and reproduction of the vascular plants, including comparative study of organs occurring in each group.
Prerequisite: BZ 120 or LIFE 103.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 340 Field Mammalogy Credits: 4 (1-6-0)

Course Description: An intensive field course that introduces field wildlife techniques through the lens of studying the evolutionary relationships, ecology, and conservation of Colorado mammals. Opportunities to learn about wildlife handling and study techniques and apply them in independent research projects. A significant portion of the course is spent in the field, primarily at the Semi-arid Grasslands Research Center northeast of Fort Collins.
Prerequisite: BZ 110 or LIFE 103.
Registration Information: Must register for lecture and laboratory. Required field trips. Credit not allowed for both BZ 340 and BZ 380A3.
Term Offered: Summer.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 346 Population and Evolutionary Genetics Credits: 3 (3-0-0)

Course Description: Evolutionary theories and history; heredity mechanisms that are basis for variation, evolution, and biological communication between generations.
Prerequisite: (BZ 220) and (MATH 155) and (STAT 301 or STAT 307 or ERHS 307).
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 348 Theory of Population and Evolutionary Ecology Credits: 4 (3-3-0)

Also Offered As: MATH 348.
Course Description: Principles and methods for building, analyzing, and interpreting mathematical models of ecological and evolutionary problems in biology.
Prerequisite: MATH 155 or MATH 160.
Registration Information: Must register for lecture and laboratory. Credit allowed for only one of the following: BZ 348, BZ 548, MATH 348.
Term Offered: Fall.

Grade Mode: Traditional.
Special Course Fee: No.

BZ 350 Molecular and General Genetics Credits: 4 (3-0-1)

Course Description: Mendelian, molecular, and population genetics emphasizing the molecular basis of genetics.
Prerequisite: (BZ 110 or BZ 120 or LIFE 102) and (STAT 201, may be taken concurrently or STAT 301, may be taken concurrently or STAT 307, may be taken concurrently or ERHS 307, may be taken concurrently).
Registration Information: Must register for lecture and recitation. Primarily for students in biological sciences.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 353 Global Change Ecology, Impacts and Mitigation Credits: 3 (3-0-0)

Also Offered As: NR 353.
Course Description: Ecological impacts of human-induced global change, and the strategies that can/are being used to adapt to and mitigate these impacts.
Prerequisite: LIFE 320 or LIFE 220 or LAND 220.
Registration Information: Credit not allowed for both BZ 353 and NR 353.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 360 Bioinformatics and Genomics Credits: 3 (3-0-0)

Course Description: Genomics, bioinformatics, and basic computer programming for biologists.
Prerequisite: BZ 110 or BZ 120 or LIFE 102.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 384 Supervised College Teaching Credits: Var[1-5] (0-0-0)

Course Description:
Prerequisite: None.
Registration Information: 3.0 overall GPA; written consent of instructor; grade of A in course with which student assists. A maximum of 10 combined credits for all 384 and 484 courses are counted towards graduation requirements.
Terms Offered: Fall, Spring.
Grade Mode: Instructor Option.
Special Course Fee: No.

BZ 401 Comparative Animal Physiology Credits: 3 (3-0-0)

Course Description: Physiological mechanisms of digestion, metabolism, osmoregulation, excretion, circulation, and respiration in vertebrate and invertebrate animals.
Prerequisite: BZ 214.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 402 Molecular Cytogenics Credits: 4 (3-3-0)

Course Description: Structure, function, and behavior of chromosomes during interphase, mitosis, and meiosis.
Prerequisite: (BZ 310, may be taken concurrently or LIFE 210, may be taken concurrently) and (BZ 350, may be taken concurrently or LIFE 201A, may be taken concurrently or LIFE 201B, may be taken concurrently or SOCR 330, may be taken concurrently).
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 403 Comparative Endocrinology Credits: 3 (3-0-0)

Course Description: Comparison of endocrine molecules, responses, and control mechanisms in vertebrates and invertebrates emphasizing molecular aspects.
Prerequisite: BZ 310.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 418 Ecology of Infectious Diseases Credits: 4 (3-0-1)

Course Description: Ecological perspectives of infectious disease outbreaks in wildlife and human populations.
Prerequisite: LIFE 320.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 424 Principles of Systematic Zoology Credits: 3 (3-0-0)

Also Offered As: BSPM 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 BZ 424 and BSPM 424.

Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 425 Molecular Ecology Credits: 3 (3-0-0)

Course Description: Introduction to molecular genetic markers for questions in ecology, evolution, behavior, and conservation.
Prerequisite: (BZ 220 and BZ 350) and (STAT 301 or STAT 307).
Registration Information: Credit not allowed for both BZ 425 and BZ 525.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 440 Plant Physiology Credits: 3 (3-0-0)

Course Description: Functions and activities of plants.
Prerequisite: BZ 120 or LIFE 103.
Registration Information: Sections may be offered: Online.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 441 Plant Physiology Laboratory Credits: 2 (0-2-1)

Course Description: Laboratory applications of plant physiology principles.
Prerequisite: BZ 440, may be taken concurrently.
Registration Information: Must register for laboratory and recitation.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 450 Plant Ecology Credits: 4 (3-2-0)

Course Description: Relation of plants to their environment.
Prerequisite: LIFE 103 or BZ 120.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 460 Genome Evolution Credits: 4 (3-0-1)

Course Description: Evolution of DNA, RNA, and proteins; use of genomic data to infer evolutionary history and processes.
Prerequisite: BZ 220 and BZ 350.

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

BZ 462 Parasitology and Vector Biology Credits: 5 (3-4-0)

Also Offered As: BSPM 462 and MIP 462.
Course Description: Protozoa, helminths, and insects and related anthropods 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: BZ 462, BSPM 462, MIP 462.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

BZ 471 Stream Biology and Ecology Credits: 3 (3-0-0)

Course Description: Biology and ecology of running waters.
Prerequisite: LIFE 320 or LAND 220 or LIFE 220.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

BZ 472 Stream Biology and Ecology Laboratory Credit: 1 (0-3-0)

Course Description: Field sampling and laboratory analysis of habitats, biota, and ecological relationships in running waters.
Prerequisite: BZ 471, may be taken concurrently.
Registration Information: Required field trips.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: Yes.

BZ 474 Limnology Credits: 3 (2-2-0)

Course Description: Biology, chemistry, and physics of lakes including limnological methods.
Prerequisite: LIFE 320 or LAND 220 or LIFE 220.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: Yes.

BZ 476 Genetics of Model Organisms Credits: 3 (3-0-0)

Also Offered As: BZ 576.
Course Description: Advanced topics in model genetic systems including molecular and developmental genetics.
Prerequisite: BZ 350 or LIFE 201A or LIFE 201B or SOCR 330.
Registration Information: Junior standing. Credit not allowed for both BZ 476 and BZ 576.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

DATA SCIENCE (DSCI)

DSCI 335 Inferential Reasoning in Data Analysis Credits: 3 (3-0-0)
Course Description: Sources of data collection errors and uncertainties, type of studies, interaction versus confounding, fair use of data, confidentiality and disclosure.
Prerequisite: **CO 300** or **CO 301B** or **CO 302** or **JTC 300**.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ECOSYSTEM SCIENCE AND SUSTAINABILITY (ESS)

ESS 220 Research Skills for Ecosystem Science I Credit: 1 (0-0-1)
Course Description: Fundamental skills for participating in ecosystem science research through hands-on learning modules.
Prerequisite: None.
Registration Information: Written consent of instructor.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 221 Research Methods for Ecosystem Science II Credit: 1 (0-0-1)
Course Description: Advanced topics in the practice of the scientific method and participation in research.
Prerequisite: **ESS 220**.
Registration Information: Written consent of instructor.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 330 Quantitative Reasoning for Ecosystem Science Credits: 3 (2-2-0)
Course Description: Understanding diverse approaches for using data and models to understand complex ecological systems.
Prerequisite: (**ESS 211** or **LIFE 320**) and (**MATH 155** or **MATH 160**) and (**STAT 301** or **STAT 307** or **STAT 315**).
Registration Information: Junior or senior standing.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ENVIRONMENTAL AND RADIOLOGICAL HEALTH SCIENCE (ERHS)

ERHS 332 Principles of Epidemiology Credits: 3 (3-0-0)
Course Description: Use of epidemiological methods in studying distribution of diseases in human populations.
Prerequisite: (**STAT 301**, may be taken concurrently or **STAT 307**, may be taken concurrently) and (**MIP 300**, may be taken concurrently).
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ERHS 446 Environmental Toxicology Credits: 3 (3-0-0)
Course Description: Essentials of environmental toxicology based on problem-oriented discussions addressing environmental impacts of organic/inorganic chemicals.
Prerequisite: **CHEM 245** or **CHEM 343** or **CHEM 346**.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ERHS 448 Environmental Contaminants: Exposure and Fate Credits: 3 (3-0-0)
Course Description: Pathways of exposure and behavior of environmental contaminants. Exposure assessment in environmental health protection.
Prerequisite: (**CHEM 245** or **CHEM 341** or **CHEM 345**) and (**LIFE 102**).
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

FISH, WILDLIFE AND CONSERVATION BIOLOGY (FW) COURSES

FW 260 Principles of Wildlife Management Credits: 3 (3-0-0)
Course Description: Ecology principles applied to conservation and management of fish/wildlife resources. Quantitative methods, socioeconomic factors, population dynamics.
Prerequisite: (**MATH 124** or **MATH 160**) and (**BZ 110** or **LIFE 103**).
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

FW 455 Principles of Conservation Biology Credits: 3 (3-0-0)
Course Description: Review of efforts to study and conserve biological diversity, focused on fish and wildlife populations.
Prerequisite: (**FW 260** and **LIFE 320**) and (**STAT 301** or **STAT 307**).
Registration Information: Credit allowed for only one of the following: **FW 455**, **FW 555**, or **NR 300**.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

FW 465 Managing Human-Wildlife Conflicts Credits: 3 (2-2-0)
Course Description: Methods for resolving conflicts caused by wildlife; integrating animal behavior, population dynamics, economics, and human dimensions into solutions.
Prerequisite: FW 260.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: Yes.

FW 475 Conservation Decision Making Credits: 3 (3-0-0)
Course Description: Structured approaches to conservation and management of vertebrates; articulating objectives, developing management options, and predicting outcomes.
Prerequisite: (MATH 155 or MATH 160) and (STAT 301).
Registration Information: Junior or senior standing.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

FORESTRY (F) COURSES

F 310 Forest and Rangeland Ecogeography Credits: 3 (2-2-0)
Also Offered As: RS 310.
Course Description: Distribution of wildland plant communities and identification of important grasses, forbs, shrubs, and trees common in North America.
Prerequisite: BZ 101 or BZ 104 or BZ 110 or BZ 120 or LIFE 102.
Registration Information: Must have concurrent registration in F 312. Must register for lecture and laboratory. Credit not allowed for both F 310 and RS 310.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

F 311 Forest Ecology Credits: 3 (3-0-0)
Course Description: Relationships of ecological concepts to the dynamics of forest ecosystems.
Prerequisite: LIFE 320 or LAND 220 or LIFE 220.
Terms Offered: Fall, Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

F 324 Fire Effects and Adaptations Credits: 3 (3-0-0)
Course Description: Introduction to fire ecology including fire history, ecosystem effects, and organism responses.
Prerequisite: LIFE 320 or LAND 220 or LIFE 220.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

F 326 Wildland Fire Behavior and Management Credits: 3 (3-0-0)
Course Description: Physical and managerial principles influencing fire, how fires shape our forests and approaches used to manage wildland fire.

Prerequisite: LAND 220 or LIFE 220 or LIFE 320.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

F 331 Wood Products in Society Credits: 3 (2-2-0)
Course Description: Role of wood products in society; spectrum of wood products; some field trips.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

F 466 Urban and Community Forestry Credits: 3 (3-0-0)
Also Offered As: HORT 466.
Course Description: Policies and management of publicly and privately owned community forests in urbanized areas.
Prerequisite: F 310 or RS 310 or HORT 221.
Registration Information: Credit not allowed for both F 466 and HORT 466.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

FOOD SCIENCE AND HUMAN NUTRITION (FSHN)

FSHN 455 Food Systems: Impact on Health/Food Security Credits: 2 (1-0-1)
Course Description: Conventional and alternative food systems and their impact on nutrition, health, food security, and the environment.
Prerequisite: FSHN 350 or FTEC 447.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

FOOD TECHNOLOGY (FTEC)

FTEC 400 Food Safety Credits: 3 (3-0-0)
Course Description: Safety of human food emphasizing safe production, processing, marketing, preparation, consumption, and regulations.
Prerequisite: CHEM 107 or CHEM 111.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

GEOGRAPHY (GR)

GR 100 Introduction to Geography (GT-SS2) Credits: 3 (3-0-0)

Course Description: Major geographic themes applied to selected regions; physical environment, human-land relationships, regional analysis.
Prerequisite: None.
Registration Information: Sections may be offered: Online.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.
Additional Information: Social & Behavioral Sciences 3C, Geography (GT-SS2).

GR 210 Physical Geography Credits: 3 (3-0-0)
Also Offered As: ESS 210.
Course Description: Energy, mass budget, and human impacts on atmosphere, hydrosphere, and continental land surfaces.
Prerequisite: None.
Registration Information: Credit not allowed for both GR 210 and ESS 210.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

GR 303 Mountain Geography Credits: 3 (3-0-0)
Course Description: The physical and human dimensions of mountains. Examples from mountains around the world with case studies from Colorado.
Prerequisite: GR 100 to 499 - at least 3 credits.
Registration Information: Junior standing.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

GR 304 Sustainable Watersheds Credits: 3 (3-0-0)
Also Offered As: WR 304.
Course Description: Effects of climate, land use, and water use on the sustainability of water quantity and quality.
Prerequisite: None.
Registration Information: Completion of the AUCC 1B mathematics requirement. Credit not allowed for both GR 304 and WR 304.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.
Additional Information: Biological & Physical Sciences 3A.

GR 315 Quantitative Geographical Methods Credits: 3 (3-0-0)
Course Description: Methods to collect, analyze, display, and model geographic data.
Prerequisite: GR 100.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

GR 323 Remote Sensing and Image Interpretation Credits: 3 (2-2-0)
Also Offered As: NR 323.
Course Description: Remote sensing systems and applications; characteristics of photographic,

scanner and radar images; imagery interpretations.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory. Credit allowed for only one of the following: **GR 323**, **GR 503**, **NR 323**, **NR 503**.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

GR 331 Geography of Farming Systems Credits: 3 (3-0-0)
Course Description: Geographic analysis of farming systems worldwide and by region; their development over time, human-land relationships, and spatial patterns.
Prerequisite: **GR 100**.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

GR 348 Biogeography Credits: 3 (3-0-0)
Course Description: Species distribution of plants and animals in relation to earth history and environments, evolution, and ecology.
Prerequisite: GR 000 to 99999 - at least 3 credits.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

GR 420 Spatial Analysis with GIS Credits: 4 (3-2-0)
Course Description: Theory, application of geographic information systems for spatial analysis; conceptual basis of GIS, nature and use of geographic data, case studies.
Prerequisite: GR 000 to 99999 - at least 3 credits.
Registration Information: Credit not allowed for both **GR 420** and **NR 322**.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

GR 410 Climate Change: Science, Policy, Implications Credits: 3 (3-0-0)
Course Description: Implications and consequences for earth systems including the cryosphere, hydrosphere, biosphere, and human systems.
Prerequisite: **GR 100** to 499 - at least 3 credits.
Registration Information: Junior standing.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

GR 448 Forest Biogeography and Climate Change Credits: 3 (3-0-0)
Course Description: Forest adaptation and conservation in relation to global change with a focus on climate change.
Prerequisite: **ESS 211** or **ESS 311** or **F 311** or **GR 100** or **GR 210** or **ESS 210** or **GR 303** or **GR 348** or **GR 410**.
Registration Information: Junior standing.
Term Offered: Spring (odd years).

Grade Mode: Traditional.
Special Course Fee: No.

GLOBAL ENVIRONMENTAL SUSTAINABILITY (GES)

GES 101 Foundations of Environmental Sustainability Credits: 3 (3-0-0)
Course Description: Concepts, foundations, and metrics of global environmental sustainability applied to global challenges.
Prerequisite: None.
Registration Information: Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

HISTORY (HIST) COURSES

HIST 463 Science and Technology in Modern History Credits: 3 (3-0-0)
Course Description: Impact of science and technology on industry, agriculture, medicine, education, etc. Issues in science and technology policy.
Prerequisite: HIST 100 to 499XX - at least 3 credits.
Registration Information: Completion of 45 credits.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HIST 476 History of America's National Parks Credits: 3 (3-0-0)
Course Description: The national park system and its development from concept to design to implementation.
Prerequisite: HIST 100 to 499XX - at least 3 credits.
Registration Information: Completion of 45 credits.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HIST 478 Heritage Resource Management Credits: 3 (3-0-0)
Also Offered As: ANTH 478.
Course Description: Cultural resource laws and policy; practices commonly employed in the management and preservation of these diverse resources.
Prerequisite: None.
Restriction: .
Registration Information: Junior or senior standing. Credit not allowed for both HIST 478 and ANTH 478.

Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

HORTICULTURE (HORT)

HORT 310 Greenhouse Management Credits: 4 (3-2-0)
Course Description: Design and use of enclosed structures to manipulate controlled environments, effects on growth as applied to crops, production, and marketing costs.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: Yes.

HORT 345 Diagnosis and Treatment in Organic Fields Credits: 2 (0-4-0)
Also Offered As: **SOCR 345**.
Course Description: Field experience in diagnosis of pest and nutrient problems on organic farms and development of treatment recommendations.
Prerequisite: (**BSPM 302** or **BSPM 308** or **BSPM 361**) and (**HORT 100** or **SOCR 100**) and (**SOCR 240**).
Registration Information: Credit not allowed for both **HORT 345** and **SOCR 345**. Required field trips.
Term Offered: Summer (even years).
Grade Mode: Traditional.
Special Course Fee: Yes.

JOURNALISM AND TECHNICAL COMMUNICATION (JTC)

JTC 100 Media in Society (GT-SS3) Credits: 3 (3-0-0)
Course Description: Role of media in American democracy; impact of media on individuals and society.
Prerequisite: None.
Registration Information: Sections may be offered: Online.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.
Additional Information: Social & Behavioral Sciences 3C, Human Behavior, Culture, or Social Frameworks (GT-SS3).

JTC 200 Professional Writing Credits: 3 (1-0-2)
Course Description: Basic elements of writing for professional and specialized audiences.
Prerequisite: **CO 150** or **HONR 193**.
Registration Information: Must register for lecture and recitation.
Terms Offered: Fall, Spring.

Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

LIFE COURSES (LIFE)

LIFE 102 Attributes of Living Systems (GT-SC1) Credits: 4 (3-3-0)

Course Description: Levels of organization, stability, and change in living systems.
Prerequisite: None.
Registration Information: Must have taken high school chemistry. Must register for lecture and laboratory. Intended for students requiring additional courses in biology or areas related to biological science.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: Yes.
Additional Information: Biological & Physical Sciences 3A, Natural & Physical Sciences w/ lab (GT-SC1).

LIFE 103 Biology of Organisms-Animals and Plants Credits: 4 (3-3-0)

Course Description: Diversity of animals and plants; their structural and functional characteristics.
Prerequisite: LIFE 102.
Registration Information: Must register for lecture and laboratory.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: Yes.

LIFE 162 Bridging the Biol/Chem Gulf for Pre-Health Majors Credits: 2 (2-0-0)

Also Offered As: KEY 162.
Course Description: Connections between chemistry and biology through inquiry-based exercises centered around societal and health issues.
Prerequisite: None.
Registration Information: Enrollment in the KEY Health Professions Learning Community. Credit not allowed for both LIFE 162 and KEY 162.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

LIFE 201A Introductory Genetics: Applied/Population/Conservation/Ecological (GT-SC2) Credits: 3 (3-0-0)

Course Description: Introduction to genetics, with emphasis on applied genetics, population genetics, and conservation/ecological genetics.

Prerequisite: LIFE 102.
Registration Information: Credit not allowed for both LIFE 201A and LIFE 201B.
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).

LIFE 201B Introductory Genetics: Molecular/Immunological/Developmental (GT-SC2) Credits: 3 (3-0-0)

Course Description: Introduction to genetics, with emphasis on applied genetics, population genetics, and conservation/ecological genetics.
Prerequisite: LIFE 102.
Restriction: Must be a: Undergraduate.
Registration Information: Credit not allowed for both LIFE 201A and LIFE 201B.
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).

LIFE 202A Introductory Genetics Recitation: Applied/Population/Conservation/Ecological Credit: 1 (0-0-1)

Course Description: Case-studies and problem solving in applied genetics, population genetics, and conservation/ecological genetics.
Prerequisite: LIFE 201A, may be taken concurrently.
Registration Information: Credit not allowed for both LIFE 202A and LIFE 202B.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LIFE 202B Introductory Genetics Recitation: Molecular Credit: 1 (0-0-1)

Course Description: Case studies and problem-solving in molecular genetics.
Prerequisite: LIFE 201B, may be taken concurrently.
Registration Information: Participation in University Honors program. Credit not allowed for both LIFE 202B and LIFE 202A.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LIFE 203 Introductory Genetics Laboratory Credits: 2 (0-3-1)

Course Description: Basic molecular genetics and molecular aspects of development laboratory.
Prerequisite: LIFE 201A, may be taken concurrently or LIFE 201B, may be taken concurrently.
Registration Information: Must register for lecture and recitation.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

LIFE 205 Microbial Biology Credits: 3 (3-0-0)

Course Description: General principles of microbiology focused on human-microbial interactions.
Prerequisite: (CHEM 107 or CHEM 111) and (LIFE 102 or BZ 110 and BZ 111).
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LIFE 206 Microbial Biology Laboratory Credits: 2 (0-4-0)

Course Description:
Prerequisite: LIFE 205, may be taken concurrently.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

LIFE 210 Introductory Eukaryotic Cell Biology Credits: 3 (3-0-0)

Course Description: Solid understanding of a cell, different cell types, molecular aspects of cellular and subcellular biology and biochemistry.
Prerequisite: CHEM 111 and CHEM 112 and LIFE 102.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LIFE 211 Introductory Cell Biology Honors Recitation Credit: 1 (0-0-1)

Course Description: Molecular aspects of cellular and subcellular biology and introductory biochemistry recitation.
Prerequisite: LIFE 210, may be taken concurrently.
Registration Information: Participation in University Honors program.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LIFE 212 Introductory Cell Biology Laboratory Credits: 2 (0-3-1)

Course Description: Molecular aspects of cellular and subcellular biology and introductory biochemistry laboratory.
Prerequisite: CHEM 112, may be taken concurrently and LIFE 210, may be taken concurrently.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

LIFE 220 Fundamentals of Ecology (GT-SC2) Credits: 3 (3-0-0)

Also Offered As: LAND 220.
Course Description: Interrelationships among organisms and their environments.
Prerequisite: (BIO 100 to 199 or BZ 100 to 199 or LIFE 100 to 199 or HORT 100) and (MATH 100 to 199).
Registration Information: Credit allowed for only one of the following: LAND 220/LIFE 220, or LIFE 320. Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
Additional Information: Biological & Physical Sciences 3A, Natural & Physical Sciences w/o lab (GT-SC2).

LIFE 320 Ecology Credits: 3 (3-0-0)

Course Description: Interrelationships among organisms and their environments using conceptual models and quantitative approaches.
Prerequisite: (BZ 101 or BZ 104 or BZ 110 or BZ 120 or LIFE 102) and (MATH 141 or MATH 155 or MATH 160).
Registration Information: Credit not allowed for more than one of the following: LIFE 220/LAND 220 or LIFE 320.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

NATURAL RESOURCES (NR)

NR 319 Geospatial Applications in Natural Resources Credits: 4 (2-4-0)
Course Description: Introduction to global positioning systems (GPS), geographic information systems (GIS) and remote sensing (RS) with natural resource applications.
Prerequisite: None.
Restriction: Must be a: Junior.
Registration Information: Junior standing. Must register for lecture and laboratory. Required field trips.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

NR 322 Introduction to Geographic Information Systems Credits: 4 (2-4-0)

Course Description: Fundamental concepts of spatial data handling and computer-assisted map analysis.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory. Credit not allowed for both **NR 322** and **GR 420**.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

NR 323 Remote Sensing and Image Interpretation Credits: 3 (2-2-0)
Also Offered As: **GR 323**.
Course Description: Remote sensing systems and applications; characteristics of photographic, scanner and radar images; imagery interpretation.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory. Credit allowed for only one of the following: **NR 323**, **NR 503**, **GR 323**, **GR 503**.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

NR 421 Natural Resources Sampling Credits: 3 (3-0-0)
Course Description: Designs, techniques, problems in sampling natural resource populations; analysis, interpretation of data.
Prerequisite: (**STAT 201** or **STAT 301**) and (**NR 220**).
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

NR 422 GIS Applications in Natural Resource Management Credits: 4 (2-4-0)
Course Description: Development and implementation of GIS projects and problems in spatial data analysis.
Prerequisite: **NR 322** or **NR 319**.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

NR 423 Applications of Global Positioning Systems Credit: 1 (.5-1-0)
Course Description: Introduction to concepts and use of global positioning systems with applications to natural resources.
Prerequisite: **NR 322** or **NR 505**.
Registration Information: Must register for lecture and laboratory.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

PHILOSOPHY (PHIL) COURSES

PHIL 104 Values, Culture, and Food Animal Agriculture Credits: 3 (3-0-0)
Also Offered As: ANEQ 104.
Course Description: Evolution of the social values and cultural understandings shaping modern animal agriculture; current problems in animal agriculture.
Prerequisite: None.
Registration Information: Non-Animal Science majors with freshman or sophomore standing. Credit not allowed for both PHIL 104 and ANEQ 104.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

PHIL 112 Reasoning and Problem Solving Credits: 3 (3-0-0)
Course Description: Creative and critical techniques in problem solving and decision making.
Prerequisite: None.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

PHIL 305G Philosophical Issues in the Professions: Research Ethics Credits: 3 (3-0-0)
Course Description: Philosophical problems, theories relevant to professions in information science.
Prerequisite: None.
Registration Information: May be repeated for credit with consent of department chair.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

PHIL 330 Agricultural and Food System Ethics Credits: 3 (3-0-0)
Also Offered As: AGRI 330.
Course Description: Basic concepts in ethics and their application to agriculture and the food system.
Prerequisite: CO 150.
Registration Information: Credit not allowed for both PHIL 330 and AGRI 330.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

PHIL 345 Environmental Ethics Credits: 3 (3-0-0)
Course Description: Scientific, philosophical, and religious concepts of nature as they bear on human conduct; an ecological perspective.
Prerequisite: None.

Restriction: Must not be a: Freshman.
Registration Information: Sophomore standing or higher.
Terms Offered: Fall, Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

SOIL AND CROP (SOCR) COURSES

SOCR 100 General Crops Credits: 4 (3-2-0)
Course Description: Production and adaptation of cultivated crops; principles affecting growth, development, management, and utilization.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

SOCR 171 Environmental Issues in Agriculture (GT-SS3) Credits: 3 (2-0-1)
Also Offered As: HORT 171.
Course Description: Historical development of agriculture; environmental consequences of modern food production and other cultural approaches to agriculture.
Prerequisite: None.
Registration Information: Must register for lecture and recitation. Credit not allowed for both SOCR 171 and HORT 171.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
Additional Information: Global & Cultural Awareness 3E, Human Behavior, Culture, or Social Frameworks (GT-SS3).

SOCR 177 Applied Information Technology in Agriculture Credit: 1 (1-0-0)
Course Description: Introduction to database and project management, GIS/GPS and remote sensing, as they apply to agriculture, the environment, and business management.
Prerequisite: None.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

SOCR 322 Principles of Microclimatology Credits: 3 (3-0-0)
Course Description: Principles of microclimatology including energy balance concepts for soil and vegetation surfaces, and their application.
Prerequisite: PH 100 to 499 - at least 3 credits.
Term Offered: Spring.

Grade Mode: Traditional.
Special Course Fee: No.

SOCR 330 Principles of Genetics Credits: 3 (3-0-0)
Course Description: Transmission, population, and molecular genetics; practical applications.
Prerequisite: BZ 110 or BZ 120 or LIFE 102.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

SOCR 331 Genetics Laboratory Credit: 1 (0-3-0)
Course Description: Experimental techniques in transmission and molecular genetics.
Prerequisite: SOCR 330, may be taken concurrently.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No

SOCR 341 Microbiology for Sustainable Agriculture Credit: 1 (1-0-0)
Course Description: Functional roles and management of soil organisms in organic agriculture, emphasis on ecological interactions with plants and plant pathogens.
Prerequisite: SOCR 240.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

SOCR 345 Diagnosis and Treatment in Organic Fields Credits: 2 (0-4-0)
Also Offered As: HORT 345.
Course Description: Field experience in diagnosis of pest and nutrient problems on organic farms and development of treatment recommendations.
Prerequisite: (BSPM 302 or BSPM 308 or BSPM 361) and (HORT 100 or SOCR 100) and (SOCR 240).
Registration Information: Credit not allowed for both SOCR 345 and HORT 345. Required field trips.
Term Offered: Summer (even years).
Grade Mode: Traditional.
Special Course Fee: Yes.

SOCR 350 Soil Fertility Management Credits: 3 (3-0-0)
Course Description: Managing soil fertility and fertilizers to meet plant nutrient requirements in an environmentally sound manner with emphasis on nutrient cycling.
Prerequisite: (CHEM 107 and CHEM 108 or CHEM 111 and CHEM 112) and (SOCR 240).
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

SOCR 351 Soil Fertility Laboratory Credit: 1 (0-2-0)
Course Description: Soil chemical analyses and development of fertilizer recommendations for crops.
Prerequisite: SOCR 350, may be taken concurrently.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

SOCR 377 Geographic Information Systems in Agriculture Credits: 3 (2-2-0)
Course Description: Introduction to geographic information systems and global positioning systems with applications to agriculture.
Prerequisite: **SOCR 100** to 499 - at least 3 credits or CS 100 to 499 - at least 3 credits.
Registration Information: Credit not allowed for both **SOCR 377** and **SOCR 577**. Required field trips.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: Yes.

SOCR 415 Pollinator Management in Agroecosystems Credits: 2 (2-0-0)
Also Offered As: **BSPM 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.

SOCR 420 Crop and Soil Management Systems I Credits: 3 (3-0-0)
Course Description: Principles of crop, soil management emphasizing environmental factors influencing crop growth and development, interactions with soil organic matter.
Prerequisite: (**HORT 100** or **SOCR 100**) and (**SOCR 240**).
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

SOCR 421 Crop and Soil Management Systems II Credits: 4 (3-2-0)
Course Description: Principles of crop and soil management with emphasis on soil erosion control, water conservation, and plant-water relationships.
Prerequisite: (**HORT 100** or **SOCR 100**) and (**SOCR 240**).
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

SOCR 424 Topics in Organic Agriculture Credits: 3 (3-0-0)
Also Offered As: HORT 424.
Course Description: Examination of issues specific to organic food production systems and marketing.
Prerequisite: (AREC 202 or ECON 202) and (AREC 328 and SOCR 240) and (HORT 100 or SOCR 100) and (SOCR 171 or HORT 171).
Registration Information: Credit not allowed for both SOCR 424 and HORT 424.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

SOCR 430 Applications of Plant Biotechnology Credits: 3 (3-0-0)
Course Description: Current and potential applications of DNA-based biotechnology in crop agriculture and other plant disciplines.
Prerequisite: **SOCR 330**.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

SOCR 455 Soil Microbiology Credits: 3 (3-0-0)
Course Description: Microbial activities in agricultural, forest, and grassland soils; in soil-plant relationships; and in maintenance of environmental quality.
Prerequisite: MIP 300 or SOCR 240.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

SOCR 456 Soil Microbiology Laboratory Credit: 1 (0-3-0)
Course Description: Techniques used in study of ecology and activities of soil microorganisms.
Prerequisite: SOCR 455, may be taken concurrently.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STATISTICS COURSES (STAT)

STAT 201 General Statistics Credits: 3 (2-0-1)
Course Description: Graphs, descriptive statistics, confidence intervals, hypothesis tests, correlation and simple regression, tests of association.
Prerequisite: MATH 100 to 200 - at least 1 credit.
Registration Information: Mathematics placement exam or one credit of 100-level mathematics. Intended as a one-semester terminal course. Must register for lecture and recitation. Credit not allowed for both **STAT 201** and **STAT 204**.

Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 301 Introduction to Statistical Methods Credits: 3 (3-0-0)
Course Description: Statistical methods in science; descriptive methods, simple probability, sampling distributions, confidence intervals, hypothesis testing, one-way ANOVA, chi-square tests, correlation, simple and multiple regression, practical concerns in inference (e.g. interpreting p-values, publication bias, replicability), reading and evaluating statistical results in published papers and popular media. Emphasis on using software rather than hand calculation to conduct analyses.
Prerequisite: **MATH 117** or **MATH 118** or **MATH 124** or **MATH 125** or **MATH 126** or **MATH 141** or **MATH 155** or **MATH 159** or **MATH 160**.
Registration Information: Sections may be offered: Online. Credit allowed for only one of the following: **STAT 301**, **STAT 307**, or **STAT 311**.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option, Traditional.
Special Course Fee: No.

STAT 305 Sampling Techniques Credits: 3 (3-0-0)
Course Description: Sample designs: simple random, stratified, systematic, cluster, unequal probability, two-phase; methods of estimation and sample size determination.
Prerequisite: **STAT 301** or **STAT 307** or ERHS 307 or **STAT 311** or **STAT 315**.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.
STAT 307 Introduction to Biostatistics Credits: 3 (3-0-0)
Course Description: Biostatistical methods; confidence intervals, hypothesis tests, simple correlation and regression, one-way analysis of variance.
Prerequisite: **MATH 117** or **MATH 118** or **MATH 124** or **MATH 125** or **MATH 126** or **MATH 141** o r **MATH 155** or **MATH 160**.
Registration Information: Credit allowed for only one of the following: **STAT 301**, **STAT 307**, or **STAT 311**.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 341 Statistical Data Analysis I Credits: 3 (3-0-0)
Course Description: Estimation and inference based upon Gaussian linear regression models; residual analysis; variable selection; non-linear regression.
Prerequisite: (**STAT 158**) and (**STAT 301** or **STAT 307** or **STAT 311** or **STAT 315**).
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
STAT 342 Statistical Data Analysis II Credits: 3 (3-0-0)
Course Description: Single-factor analysis of variance models; multi-factor analysis of variance models; randomized block design; Latin squares; split-plot design.
Prerequisite: **STAT 340** or **STAT 341**.
Term Offered: Spring.

Grade Mode: Traditional.
Special Course Fee: No.

STAT 350 Design of Experiments Credits: 3 (3-0-0)
Course Description: Analysis of variance, covariance; randomization; completely randomized, randomized block, latin-square, split-plot, factorial and other designs.
Prerequisite: **STAT 301** or **STAT 307** or ERHS 307 or **STAT 311** or **STAT 315**.
Terms Offered: Fall, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.