

CPSC - CROP SCIENCES

CPSC Class Schedule (<https://courses.illinois.edu/schedule/DEFAULT/DEFAULT/CPSC/>)

Courses

CPSC 102 Foundational Skills in Crop Sciences credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/102/>)

Introduces students to opportunities and topics to prepare for success in crop sciences: basic quantitative and writing skills; research opportunities in the department; basic research skills including ethics and safety. Prerequisite: Restricted to Crop Sciences majors, Computer Sciences + Crop Sciences majors, and ACES Undeclared majors only; restricted to first time freshmen and first time transfer students.

CPSC 103 Sustainable Agriculture credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/103/>)

Introductory course in sustainable and organic agriculture. Examine how farming evolved from the subsistence farming of indigenous cultures to today's industrial farming of the US. Learn skills to assess the risk and benefits of different agricultural systems including organic farming. Evaluate various cropping systems used in different farming systems. Explore potential future agriculture practices for a growing world population.

CPSC 112 Introduction to Crop Sciences credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/112/>)

[IAI Code: AG903] Introductory course covering the principles and practices of crop production and sustainable agroecosystem management. Topics include plant growth and development, environmental factors influencing plant productivity, soil management, fertility, and nutrient cycling, pest control principles, and sustainability challenges facing modern crop production. Concepts are discussed in lecture and reinforced in hands-on laboratory sections. Additional fees may apply. See Class Schedule.

This course satisfies the General Education Criteria for:
Nat Sci Tech - Life Sciences

CPSC 113 Environment, Agriculture, and Society credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/113/>)

Introduction to agriculture and the environment; examine the largest managed ecosystem and its influence on natural ecosystems; develop a working understanding of natural and agriculture ecosystems and their interaction; examine various agriculture management strategies that can be used to produce food for an increasing world population while maintaining or improving environmental quality.

This course satisfies the General Education Criteria for:
Nat Sci Tech - Life Sciences
Cultural Studies - Western

CPSC 116 The Global Food Production Web credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/116/>)

Introduces students to the global web involved in the production of food we consume on a daily basis. Selected ecosystems of plants, people, and cultures in Asia, Africa, and Latin America will be studied based on involvement with various crops. Presents the origin and biology of plants; their evolution with humankind in various cultures; the spread and economic importance of crops around the world; and considers current hunger and environmental issues resulting from the global food web. Interactive communications with selected scientists, producers, and traders around the world through the World Wide Web and email system of the INTERNET permit students to get personal exposure to information and activities.

This course satisfies the General Education Criteria for:
Cultural Studies - Non-West

CPSC 117 Agriculture and Science of Coffee credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/117/>)

The growth and production of coffee and its impact on society and culture. The botanical aspects of coffee, coffee varieties/cultivars, and technologies for coffee growth, harvesting, post-harvest processing, and roasting will be discussed. The wide variety of coffee beverages, coffee flavor evaluation, coffee chemistry, coffee economics, and the physiological effects of coffee will also be examined.

CPSC 131 Agriculture in Mythology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/131/>)

Compare and contrast the role agriculture and plant sciences played in the development of ancient cultures. Study agricultural references in ancient global mythology. Develop an appreciation of how agricultural diversity of various ancient cultures influenced mythology in the cultures in different regions.

This course satisfies the General Education Criteria for:
Cultural Studies - Non-West

CPSC 180 Medicinal Plants and Herbolgy credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/180/>)

The use of cultivated and wild plants in medicines and health products according to Eastern and Western medical traditions. Consideration of herbal medicine use from ancient times to the present, important medicinal chemicals produced by plants, and the evaluation of plant chemical products as potential human medicines.

CPSC 199 Special Topics credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/199/>)

Experimental course on a special topic in crop sciences. Approved for Letter and S/U grading. May be repeated if topics vary.

CPSC 212 Introduction to Plant Protection credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/212/>)

Covers the fundamentals of weeds, plant-associated insects, and plant pathogens. Lecture and laboratory material will cover diagnosis, identification, and control strategies used to improve plant health. Emphasis will be given to those pests and pathogens affecting plant agricultural production in Illinois and the Midwest.

CPSC 213 Evolution in Action credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/213/>)

Introduction to evolutionary theory. Examination of how domesticated species have evolved. Develops an appreciation of how agroecosystems influence evolution of adjacent natural ecosystems. Elucidation of evolutionary mechanisms necessary for agricultural species to adapt to global climate change.

CPSC 215 The Prairie and Bioenergy credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/215/>)

Designed for students who are interested in bioenergy and its production from prairie land. Instructors will provide information on the global trend of bioenergy production and consumption, importance of bioenergy, the role of Illinois prairie land in bioenergy production, potential U.S. bioenergy production, biofuels from plants, and socio-environmental benefits of bioenergy.

CPSC 241 Intro to Applied Statistics credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/241/>)

Introduces fundamental statistical procedures used to analyze and interpret data. General principles of descriptive and inferential statistics, measures of central tendency and dispersion, probability, correlation and regression, and tests of hypotheses are covered. An emphasis is placed on biological, environmental, and agricultural sciences, but numerous examples from other areas are discussed. Course content enhances students' ability to critically assess statistical information encountered in professional and every day activities. Credit is not given for both CPSC 241 and STAT 100, ACE 261 or ACE 262.

This course satisfies the General Education Criteria for: Quantitative Reasoning I

CPSC 261 Biotechnology in Agriculture credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/261/>)

Basic introduction to the techniques and application of biotechnology to a wide range of agricultural areas, and specific examples are given. May serve as either a terminal course explaining the techniques or as an introductory base for future studies. Prerequisite: Any 100-level course in a biosciences discipline.

This course satisfies the General Education Criteria for: Nat Sci Tech - Life Sciences

CPSC 265 Genetic Engineering Lab credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/265/>)

Laboratory/discussion course that provides a hands-on introduction to the techniques and principles of genetic engineering, recombinant DNA and the impact of molecular genetics on society. Students will isolate DNA from plants and clone specific genes into bacterial plasmids, perform polymerase chain reactions, DNA restriction analysis and DNA blotting, and discuss the relevance of these techniques to both medicine and agriculture. Additional fees may apply. See Class Schedule. Prerequisite: A general biology course.

CPSC 266 Data in Biology and Agriculture credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/266/>)

This course focuses on the use of computing and data analysis to solve problems in biology and agriculture and includes an overview of computer methods and limitations of current computer, network and storage hardware for big data sets. The nature, use and future potential of different types of computer hardware and software in biology and agriculture (e.g. mobile applications, high performance computing, wireless networking) will be discussed. Examples of computing-related and computing-limited problems in biology and agriculture, such as image analysis, remote sensing and genetic analysis will be used as case studies. The potential of computing to improve the food system, medicine and other applications will be presented.

CPSC 270 Applied Entomology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/270/>)

Lectures, laboratory, and field trips cover the biology of insects and the recognition and management of insect pests of agricultural and urban ecosystems. Covers insect structure and physiology, classification, identification, life histories, behavior, and pest management. Same as IB 220 and NRES 270.

CPSC 304 Plant Pathology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/304/>)

Lecture and laboratory cover concepts relating to causal agents of plant diseases, pathogen biology, symptoms and diagnosis, modes of infection and spread, effects of environment on disease development, and methods of control.

CPSC 326 Weed Science credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/326/>)

Fundamentals of weed biology, ecology, and management. Emphasis placed on basic principles that are relevant to both crop and non-crop ecosystems; specific management strategies used in these different ecosystems are introduced. Includes identification of common weeds of Illinois and an overview of the use and modes of action of major herbicide groups. Prerequisite: CPSC 112.

CPSC 336 Tomorrow's Environment credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/336/>)

Introduction to interdisciplinary methods of analysis of environmental problems in a finite world; examination of the concept of the limits to growth; development of a working understanding of natural systems and environmental economics; and examination of various management strategies (technical, economic, and social) that can be used to improve environmental quality. Same as CHLH 336, and ENVS 336. Prerequisite: One course in the life sciences and one course in the social sciences, or consent of instructor.

CPSC 352 Plant Genetics credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/352/>)

The principles of heredity in relation to plant improvement. Same as NRES 352. Prerequisite: IB 103 or IB 104.

CPSC 370 Applied Entomology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/370/>)

Lectures and laboratory cover the biology of insects and the recognition and management of insect pests of agricultural and urban ecosystems. Covers insect structure and physiology, classification, identification, life histories, behavior, and pest management.

CPSC 382 Organic Chem of Biol Processes credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/382/>)

An overview of the structure, properties, and reactions of carbon-containing compounds relevant to biological processes and cellular structure. The chemistry of hydro carbon, aromatic, as well as oxygen-nitrogen-, phosphorus-, and sulfur-containing compounds will be examined. Macromolecular structures including biological membranes, carbohydrates, proteins and nucleic acids will also be discussed. Prerequisites: CHEM 102 and CHEM 104 or CHEM 202 and CHEM 204.

CPSC 393 Crop Sciences Internship credit: 1 to 5 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/393/>)

Supervised experience in a field directly pertaining to a subject matter in crop sciences. Approved for S/U grading only. May be repeated in separate terms. Independent Study courses are limited to 12 hours total applying to a degree in ACES. For registration in this course, students should contact the Department Undergraduate Program Coordinator. Prerequisite: Sophomore standing, cumulative GPA of 2.0 or above at the time the internship is arranged, and consent of instructor.

CPSC 395 Undergrad Research or Thesis credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/395/>)

Independent research, special problems, thesis, development and/or design work under the supervision of an appropriate member of the faculty. May be repeated. Independent Study courses are limited to 12 hours total applying to a degree in ACES. Prerequisite: Cumulative GPA of 2.5 or above at the time the activity is arranged and consent of instructor.

CPSC 396 Undergrad Honors Res or Thesis credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/396/>)

Individual research, special problems, thesis, development and/or design work under the direction of the Honors advisor. May be repeated. Independent Study courses are limited to 12 hours total applying to a degree in ACES. Prerequisite: Junior standing, admission to the ACES Honors Program, and consent of instructor.

CPSC 407 Diseases of Field Crops credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/407/>)

Studies the symptoms of major field crop diseases, life histories of causal organisms, and methods of control. Lecture and laboratory. Additional fees may apply. See Class Schedule. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 212.

CPSC 408 Integrated Pest Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/408/>)

Examination of fundamental concepts of pest management including a historical review of pests and pest management; an overview of major pests (insects, weeds, plant diseases and vertebrate) in a variety of settings (agronomic, specialty crops, urban and structural); management options (area-wide, chemical, biological, cultural and physical); regulatory issues; and topics of current interest. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 212.

CPSC 412 Principles of Crop Production credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/412/>)

Fundamentals in crop development and management, soil structure, management, and fertility, and how crops and soils interact are examined. Students learn how to diagnose real-world problems in fields and field crops grown in the Midwestern US, and to develop practical solutions to such problems. Prepares students to be competitive in careers within commercial crop agriculture. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 112 and NRES 201, or equivalent, or consent of instructor.

CPSC 413 Agriculture, Food, and the Environment credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/413/>)

Advanced course in the complex interactions of food production resulting from different agricultural systems and the environment. Develop an appreciation of the intricacies of producing food for a growing world population while minimizing the impact on the natural environment. Understand the implementation of new technology and strategies for future food production. 2 undergraduate hours. 2 graduate hours. Prerequisite: CPSC 112 or CPSC 113 or equivalent course or consent of instructor.

CPSC 414 Forage Crops & Pasture Ecology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/414/>)

Forages, their plant characteristics, ecology, and production; grasslands of farm and range as related to animal production and soil conservation. 3 undergraduate hours. 3 graduate hours. Offered in alternate years. Prerequisite: An introductory class in biology.

CPSC 415 Bioenergy Crops credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/415/>)

Provides an overview and understanding of biomass feedstock production systems for sustainable biofuels production. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 112 or consent of instructor.

CPSC 416 Native Plants, Pollinators, & Food Ecosystems credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/416/>)

Introduction to herbaceous native and non-native plants cultivated for landscape applications - conservation, uses, benefits for pollinators, significance for local biodiversity, and contribution to food production. Learn to: identify plants, establish and maintain plantings, and to enhance the interaction between beneficial insects and food crops. 3 undergraduate hours. 3 graduate hours. Credit is not given for CPSC 416 if credit for NRES 415 or HORT 344 has been earned. Prerequisite: HORT 100, IB 103, or basic Plant Biology course.

CPSC 418 Crop Growth and Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/418/>)

Crop physiology and management as influenced by environment, plant species, and cropping system; relates plant growth processes to crop production practices based on current research. 3 undergraduate hours. 3 graduate hours. Prerequisite: IB 103 or CPSC 112 or equivalent, or consent of instructor.

CPSC 419 Midwest Agricultural Practices credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/CPSC/419/>)

Introduces agronomic production practices in the Midwest and economics of the crop production value chain. Specifically designed for beginning graduate students in crop genetic improvement from non-agricultural backgrounds. 1 undergraduate hour. 1 graduate hour.

CPSC 426 Weed Mgt in Agronomic Crops credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/426/>)

Principles of weed ecology and biology, and their application to weed management. Herbicides and their use in corn, soybeans and other agronomic crops. Specialized topics include weed management in reduced tillage, herbicide tolerant crops and management of problem weeds. Additional fees may apply. See Class Schedule. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 212 or consent of instructor.

CPSC 428 Weed Science Practicum credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/428/>)

Intensive course on field diagnostic skills in weed science. Topics include weed and weed seed identification, sprayer calibration, herbicide application, herbicide injury symptomatology, and field diagnostics. Students who complete the course will be encouraged to enter the North Central Weed Science Society weeds contest, which occurs during the summer. Additional fees may apply. See Class Schedule. 2 undergraduate hours. 2 graduate hours. Prerequisite: CPSC 212 or CPSC 426 or consent of instructor.

CPSC 431 Plants and Global Change credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/431/>)

The science of global atmospheric and climate change in the 21st Century. Understanding of how plants, including crops, will respond and may be adapted to these changes. Using plants to ameliorate predicted climate change. Same as IB 440 and NRES 431. 3 undergraduate hours. 3 graduate hours. Offered in alternate years. Prerequisite: CPSC 112 or IB 103.

CPSC 433 Basic Toxicology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/433/>)

Same as CB 449, ENVS 480 and FSHN 480. See FSHN 480.

CPSC 436 Conservation Biology credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/436/>)

Same as ENVS 420 and IB 451. See IB 451.

CPSC 437 Principles of Agroecology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/437/>)

Examines the dynamics and function of agricultural ecosystems and reviews fundamental concepts of ecology. Agricultural systems will be compared on the basis of energy flow, nutrient cycling, diversity, stability and required inputs. 3 undergraduate hours. 3 graduate hours. Offered in alternate years. Prerequisite: IB 100 or IB 103 or equivalent.

CPSC 438 Soil Nutrient Cycling credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/438/>)

Same as NRES 438. See NRES 438.

CPSC 439 Env and Sustainable Dev credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/439/>)

Same as NRES 439. See NRES 439.

CPSC 440 Applied Statistical Methods I credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/440/>)

Statistical methods involving relationships between populations and samples; collection, organization, and analysis of data; and techniques in testing hypotheses with an introduction to regression, correlation, and analysis of variance limited to the completely randomized design and the randomized complete-block design. Same as ANSC 440, FSHN 440, NRES 440, and NUTR 440. 4 undergraduate hours. 4 graduate hours. Prerequisite: MATH 112 or equivalent.

CPSC 444 Introduction to Spatial Analytics credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/444/>)

New technologies in biological sciences make it possible to collect information in time and space and analyze it to open new insights with broad impact in academia and industry. The goal in this course is to provide students with a broad understanding of how to collect and integrate spatial datasets and to develop analytical skills for use in research and decision making. 4 undergraduate hours. 4 graduate hours. Prerequisite: CPSC 440 or equivalent, and some familiarity with R.

CPSC 448 Biological Modeling credit: 3 or 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/448/>)

Same as ANSC 449, GGIS 468, and IB 491. See GGIS 468.

CPSC 452 Advanced Plant Genetics credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/452/>)

Survey of selected contemporary topics in plant genetics and genomics. Topics include the nature of genes and genomes, crop domestication, selection, allelic diversity in populations, and genetics mapping. Serves as an introduction to functional genomics, population genetics, transmission genetics, quantitative genetics, and bioinformatics. Same as IB 478. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 352 or IB 204, or consent of instructor.

CPSC 453 Principles of Plant Breeding credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/453/>)

Principles, concepts and tools used in plant breeding. Includes methods and breeding schemes used with different plant species. Additional fees may apply. See Class Schedule. 4 undergraduate hours. 4 graduate hours. Prerequisite: IB 103; CPSC 352 or equivalent.

CPSC 454 Plant Breeding Methods credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/454/>)

Discussion of the application of current scientific tools and methods available to plant breeders for improving plants; emphasis on actual use of plant breeding methods and production of high quality seed. 2 undergraduate hours. 2 graduate hours. Offered summer only in alternate years. Prerequisite: CPSC 453.

CPSC 466 Genomics for Plant Improvement credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/466/>)

An overview of applying the methods of genomics to discover variation in genes and their expression, creating new genetic variation, and applying this information to the improvement of economically important plants. Emphasis is on recent advances in genomic science and activities where functional genomics information is used to efficiently create and manipulate desirable phenotypes. 2 undergraduate hours. 2 graduate hours. Prerequisite: CPSC 352 or a similar course, or consent of instructor.

CPSC 473 Mgmt of Field Crop Insects credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/473/>)

Ecological principles of insect populations in agroecosystems including: sampling insect populations, threshold development, bioeconomics and decision-making, population regulation, designing management strategies for field crop insect pests, and deployment of transgenic crops for management of insect pests. Case studies describing various pest management programs in field-crop settings will be provided. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 270 or an equivalent course, or consent of instructor.

CPSC 479 Insect Pest Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/479/>)

Same as IB 482. See IB 482.

CPSC 480 Cannabis Classification and Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/480/>)

Designed to provide students with an understanding of the cannabis classification system and proper management practices for target compounds and products. Understanding cannabis biology and taxonomic classification is critical for proper management practices for the production of essential oils, psychoactive compounds, fiber, and seed oil and protein, and applications of those products. Discrepancies between scientific and vernacular names of cannabis and the inconsistency of vernacular names mislead producers and consumers. This course will discuss the taxonomy and vernacular nomenclature of cannabis and cannabis biology will be discussed based on individual subspecies. The subspecies classification will be necessary for proper management practices and harvesting of target compounds and products. 3 undergraduate hours. 3 graduate hours. Prerequisite: Students are expected to have basic knowledge of plant biology or consent of instructor.

CPSC 481 Principles and Practices of Cannabis Flower Production credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/481/>)

Explores indoor and outdoor cannabis flower production management practices. Topics covered include botany, growth and development, cultivar selection, planting and harvesting, growing systems and media, nutrient and water management, pest management, environmental controls such as lighting, media, ventilation. 3 undergraduate hours. 3 graduate hours. Prerequisite: Not intended for students with Freshman or Sophomore class standing.

CPSC 484 Plant Physiology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/484/>)

Same as IB 420. See IB 420.

CPSC 485 Cannabis Phytochemistry: Analysis, Applications and Beyond credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/485/>)

Explores Cannabis as a multipurpose plant with unique and complex chemical traits driving diverse value networks of supplements, cosmetics, food, and medicinal products. The biosynthesis, variation, and functions of major structural classes of phytochemicals in Cannabis will be examined, along with methods of extraction and analysis of chemical constituents applicable to fundamental plant research, industrial-scale production, quality and safety testing, and regulatory compliance in the U.S. Students will critically evaluate information sources pertaining to Cannabis and its purported health claims. 3 undergraduate hours. 3 graduate hours. Prerequisite: Not intended for students with Freshman or Sophomore class standing.

CPSC 486 Plant Growth and Development credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/486/>)

Plant growth and development is a complex and highly regulated process that occurs over various spatiotemporal scales. This advanced interdisciplinary course integrates genetic, molecular, cellular, biochemical, anatomical, and physiological information in order to explore the life of a plant from its embryonic origins to its final death. Same as IB 479. 3 undergraduate hours. 3 graduate hours. Prerequisite: IB 103; CPSC 352 or IB 204, or equivalent.

CPSC 488 Soil Fertility and Fertilizers credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/488/>)

Same as NRES 488. See NRES 488.

CPSC 489 Photosynthesis credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/489/>)

Same as BIOP 432 and IB 421. See IB 421.

CPSC 491 Ugrad Bioinformatics Seminar credit: 0 to 2 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/491/>)

Same as INFO 491. See INFO 491.

CPSC 498 Crop Sci Professional Developmt credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/CPSC/498/>)

Topics related to professional development including resumes, interview skills, business etiquette, ethics, and presentations on opportunities in crop sciences and horticulture. 1 undergraduate hour. No graduate credit. Prerequisite: Junior standing in Crop Sciences or Horticulture.

CPSC 499 Advanced Special Topics credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/499/>)

Advanced experimental course on a special topic in crop sciences. 1 to 4 undergraduate hours. 1 to 4 graduate hours. Approved for Letter and S/U grading. May be repeated if topics vary.

CPSC 501 Programming for Genomics credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/501/>)

Same as IB 501. See IB 501.

CPSC 505 Research Methods in Crop Sciences credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/505/>)

Lectures, discussions, and seminars dealing with research in crop sciences.

CPSC 508 Integrated Pest Management credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/508/>)

In Integrated Pest Management we will examine the fundamental concepts of pest management including a historical review of pests and pest management; an overview of major arthropod pests in a variety of settings (agronomic, specialty crops, urban and structural); current management options (area-wide, chemical, biological, cultural and physical); regulatory issues; and topics including emerging pest issues.

CPSC 518 Crop Growth and Development credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/518/>)

Study of the physiological processes involved in growth and development of crop plants and the interaction of these processes with the environment that influences productivity. Prerequisite: CPSC 418 or CPSC 484.

CPSC 526 Herbicide Action in Plants credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/526/>)

Study of various chemicals used to inhibit plant growth, including their uptake, translocation, mode of action, metabolism and resistance mechanisms in plants; and the relationship of chemical structure to the environmental fate of herbicides. Offered in alternate years. Prerequisite: CPSC 426 and CPSC 484.

CPSC 527 Weed Science and Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/527/>)

Advanced course on the biological and practical aspects of weeds and their management within Midwest agricultural systems. Includes discussions of current scientific literature to understand the latest advancements in weed science and management. Prerequisite: CPSC 212. For Crop Sciences Online MS students only.

CPSC 538 Environmental Plant Physiology credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/538/>)

Same as IB 542. See IB 542.

CPSC 540 Applied Statistical Methods II credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/540/>)

Statistical methods as tools for research. Principles of designing experiments and methods of analysis for various kinds of designs, experimental (completely randomized, randomized complete block, split plots, Latin square) and treatment (complete factorial); covariate analysis. Credit is not given for CPSC 540 if credit for CPSC 542 has been given. Prerequisite: CPSC 440 or equivalent.

CPSC 541 Regression Analysis credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/541/>)

The application of regression methods to problems in the agricultural, biological, and life sciences. Topics include simple linear, multiple linear, nonlinear, and logistic regression analysis and correlation analysis. Emphasis is placed on predictor variable selection, diagnostics, model selection and validation, and remedial measures, including ridge regression, weighted least squares regression, and the use of autoregressive models. Both quantitative and qualitative predictor variables are examined. SAS and R will be used. Same as ANSC 541. Prerequisite: CPSC 440 or equivalent.

CPSC 543 Appl. Multivariate Statistics credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/543/>)

This class introduces students to statistical methods that consider several variables at once. Emphasis will be given to the applications of multivariate methods to data sets in biology and ecology. Students will develop good knowledge as to how multivariate methods work, they will be able to apply these methods using SAS and R and they will be able to make inferences on the results of the analyses for subsequent scientific publication. Same as STAT 543. Prerequisites: CPSC 440 or equivalent or consent of instructor.

CPSC 554 Quantitative Genetics and Genomics credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/554/>)

Most important traits in plant species are quantitative, which means that they are affected by large numbers of genes and their interaction with the environment. Many techniques and tools have developed to try to accelerate quantitative trait improvement, however understanding these methods and how to apply them appropriately remains a significant challenge for breeders and breeding organizations. Through this course, students will gain knowledge on fundamental quantitative genetics concepts and learn how to apply this knowledge to everyday plant breeding situations. Special attention will be given to the application of QTL discovery, population improvement, and genomic selection in plant breeding programs. Each class will consist of a combination of lecture and in-class computer exercises conducted in small groups that the instructor will coach individually. Weekly readings from textbooks and/or primary sources will be assigned to help deepen student's understanding of the topics covered in class. Prerequisite: CPSC 352 or equivalent and CPSC 440 or equivalent. Familiarity with population genetics, plant breeding, mixed models, matrix algebra, and the R programming language is recommended.

CPSC 555 Crop Germplasm Resources credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/555/>)

In this course students will explore the use, curation and collection of germplasm resources to facilitate crop improvement. Genetic diversity is the foundational resource that plant breeders use for the benefit of society; however, it is often challenging to identify, access, and use desirable genes from relatives of crop plants. Strategies and methods employed by plant breeders, curators and collectors will be discussed. Topics will include using distant relatives in breeding program, selecting a subset of accessions for evaluations when large collections are available, circumventing breeding barriers to obtain wide-cross progenies, navigating intellectual property issues, and writing a successful plant exploration proposal. Prerequisite: Introductory courses in genetics (e.g. CPSC 352) and plant breeding (e.g. CPSC 453) or equivalent.

CPSC 556 Plant Breeding Literature credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/CPSC/556/>)

Students will read a diverse group of plant breeding journal articles, will learn skills involved in evaluating a scientific paper, and will discuss articles with plant breeding faculty members. Approved for S/U grading only. May be repeated in separate terms to a maximum of 5 hours. Prerequisite: Graduate student status.

CPSC 563 Chromosomes credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/563/>)

Includes cytogenetic analysis of eukaryotic organisms, the role of chromosomes in genome organization and evolution, and introduction to molecular cytogenetic laboratory techniques such as mitotic analysis, chromosome banding, flow cytogenetics, somatic cell genetics, chromosomal length polymorphisms, fluorescent microscopy and in situ hybridization. Prerequisite: CPSC 352 or consent of instructor.

CPSC 565 Perl & UNIX for Bioinformatics credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/565/>)

This intensive course is an introduction to high-throughput bioinformatics and genome data analysis. An introduction to programming with Perl and Bioperl will be given, and students will learn to write scripts relevant to their own research goals. We will also cover the use of UNIX and Perl for automating and customizing bioinformatics tools. Prerequisite: Graduate status or consent of instructor. In addition, familiarity with DNA and protein sequence data, and basic Windows computing skills are required.

CPSC 566 Plant Gene Regulation credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/566/>)

Current topics and literature on the function and regulation of higher plant genes. Topics of emphasis: transposable elements, their effect on gene expression and variation, and uses in tagging and isolating genes; the developmental, tissue specific, or environmental regulations of plant genes; the structure, synthesis, subcellular targeting, and regulation of major cereal and legume seed proteins; the use of genetic engineering to explore the regulation of plant genes or to alter traits of agricultural importance. Prerequisite: CPSC 352, MCB 450, or consent of instructor.

CPSC 567 Bioinformatics & Systems Biol credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/567/>)

Bioinformatics and Systems Biology are emerging disciplines that address the need to manage and interpret the massive quantities of data generated by genomic research. In systems biology, advances in genomics, bioinformatics, and structural biology are used to generate global and unified views that integrate fragmentary knowledge of biological systems, their components and their interrelationships. This course is intended for students interested in the crossroads of biology and computational science and includes both lectures and hands-on experience. Same as IB 505. Prerequisite: Graduate level status or consent of instructor.

CPSC 569 Applied Bioinformatics credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/569/>)

Same as ANSC 542 and IB 506. See ANSC 542.

CPSC 575 Scientific Writing: Proposals, Manuscripts, and Peer Review credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/575/>)

Advanced writing course covering topics specific to scientific writing, with emphasis on proposals, manuscripts, and peer review. Prerequisite: Any 599 credit (sufficient data or research results for at least one figure or table).

CPSC 588 Plant Biochemistry credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/588/>)

Enzymes and pathways involved in plant intermediary metabolism. Basic cell physiology, bioenergetics, and hormonal regulation of metabolism. Same as IB 524. Prerequisite: CPSC 484 and MCB 450.

CPSC 591 Grad Bioinformatics Seminar credit: 0 to 2 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/591/>)

Same as ANSC 591 and INFO 591. See INFO 591.

CPSC 593 Adv Studies in Crop Sciences credit: 1 to 8 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/593/>)

Directed studies of selected problems or topics relevant to Crop Sciences. Study may be in one of the following fields: 1) Plant Breeding and Genetics; 2) Plant Molecular Biology; 3) Plant Physiology; 4) Crop Production and Ecology; 5) Biometrics; 6) Plant Pathology; 7) Entomology; and 8) Weed Science. May be repeated up to 4 hours in the same term and to a maximum of 12 hours in separate terms, if topics vary. Prerequisite: Consent of instructor.

CPSC 594 Professional Orientation CPSC credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/CPSC/594/>)

Discussion of the philosophy and components of graduate education in Crop Sciences including discussion of the development of methods and strategies useful in research, teaching, and extension. Students will be required to develop and submit a proposal describing planned research for a non-thesis research project, M.S. thesis or Ph.D. Dissertation. Approved for S/U grading only.

CPSC 598 Seminar credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/CPSC/598/>)

Current research in crops, genetic engineering, plant protection and other topics relevant to Crop Sciences. Approved for both letter and S/U grading. May be repeated to a maximum of 14 hours if topics vary. Prerequisite: Graduate standing.

CPSC 599 Thesis Research credit: 0 to 16 Hours. (<https://courses.illinois.edu/schedule/terms/CPSC/599/>)

Individual research under supervision of faculty. Required of all students working toward the Master of Sciences (thesis option) or Doctor of Philosophy in Crop Sciences. Approved for S/U grading only. May be repeated in separate semesters.