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/)
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 Herbology  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.

Information listed in this catalog is current as of 07/2022
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 or ACE 261.
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.
This course satisfies the General Education Criteria for:
Nat Sci Tech - Life Sciences

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 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 hydrocarbon, 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.

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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/](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/](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/](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/](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/](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/](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 ABE 440, 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/](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/](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/](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/](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/](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 462  Plant Molecular Biology  credit: 1 Hour. ([https://courses.illinois.edu/schedule/terms/CPSC/462/](https://courses.illinois.edu/schedule/terms/CPSC/462/))
Same as IB 472. See IB 472.

CPSC 466  Genomics for Plant Improvement  credit: 2 Hours. ([https://courses.illinois.edu/schedule/terms/CPSC/466/](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 genomics 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 467  Plant Genomics  credit: 1 Hour. ([https://courses.illinois.edu/schedule/terms/CPSC/467/](https://courses.illinois.edu/schedule/terms/CPSC/467/))
Same as IB 473. See IB 473.

CPSC 473  Mgmt of Field Crop Insects  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/CPSC/473/](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 475  Insect Pathology  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/CPSC/475/](https://courses.illinois.edu/schedule/terms/CPSC/475/))
Same as IB 483. See IB 483.

CPSC 479  Insect Pest Management  credit: 3 Hours. ([https://courses.illinois.edu/schedule/terms/CPSC/479/](https://courses.illinois.edu/schedule/terms/CPSC/479/))
Same as IB 482. See IB 482.

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### CPSC 540   Applied Statistical Methods II   credit: 4 Hours.
Same as IB 542. See IB 542.

### CPSC 489   Photosynthesis   credit: 3 Hours.
Same as BIOP 432 and IB 421. See IB 421.

### CPSC 491   Ugrad Bioinformatics Seminar   credit: 0 to 2 Hours.
Same as INFO 491. See INFO 491.

### CPSC 498   Crop Sci Professional Developmt   credit: 1 Hour.
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.
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.
Same as IB 501. See IB 501.

### CPSC 505   Research Methods in Crop Sciences   credit: 4 Hours.
Lectures, discussions, and seminars dealing with research in crop sciences. 4 graduate hours. No professional credit.

### CPSC 518   Crop Growth and Development   credit: 4 Hours.
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.
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.
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. 3 graduate hours. No professional credit. Prerequisite: CPSC 212. For Crop Sciences Online MS students only.

### CPSC 538   Environmental Plant Physiology   credit: 4 Hours.
Same as IB 542. See IB 542.

### CPSC 540   Applied Statistical Methods II   credit: 4 Hours.
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; use of SAS for all analyses. 4 graduate hours. No professional credit. 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.
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. 4 graduate hours. No professional credit. Prerequisite: CPSC 440 or equivalent.
CPSC 543  Appl. Multivariate Statistics  credit: 4 Hours. ([link](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 545  Statistical Genomics  credit: 3 or 4 Hours. ([link](https://courses.illinois.edu/schedule/terms/CPSC/545/))
Same as ANSC 545 and IB 507. See ANSC 545.

CPSC 554  Quantitative Genetics and Genomics  credit: 3 Hours. ([link](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. 3 graduate hours. No professional credit. 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. ([link](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. 2 graduate hours. No professional credit. 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. ([link](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 557  Chromosomes  credit: 3 Hours. ([link](https://courses.illinois.edu/schedule/terms/CPSC/557/))
Includes cyogenetic 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. 3 graduate hours. No professional credit. Prerequisite: CPSC 352 or consent of instructor.

CPSC 558  Perl & UNIX for Bioinformatics  credit: 2 Hours. ([link](https://courses.illinois.edu/schedule/terms/CPSC/558/))
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 559  Plant Gene Regulation  credit: 4 Hours. ([link](https://courses.illinois.edu/schedule/terms/CPSC/559/))
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. 4 graduate hours. No professional credit. Prerequisite: CPSC 352, MCB 450, or consent of instructor.

CPSC 562  Bioinformatics & Systems Biol  credit: 4 Hours. ([link](https://courses.illinois.edu/schedule/terms/CPSC/562/))
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 563  Applied Bioinformatics  credit: 4 Hours. ([link](https://courses.illinois.edu/schedule/terms/CPSC/563/))
Same as ANSC 542 and IB 506. See ANSC 542.

CPSC 575  Scientific Writing: Proposals, Manuscripts, and Peer Review  credit: 3 Hours. ([link](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. 3 graduate hours. No professional credit. 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. 4 graduate hours. No professional credit. 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. 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. 0 to 16 graduate hours. No professional credit. Approved for S/U grading only. May be repeated in separate semesters.

Information listed in this catalog is current as of 07/2022