BACHELOR OF SCIENCE IN CROP SCIENCES

Prescribed Courses including Campus General Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>RHET 105</td>
<td>Writing and Research and Public Speaking (or equivalent - see College Composition I requirement)</td>
<td>6-7</td>
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</table>

Advanced Composition

Select one course from campus approved list. 3-4

Cultural Studies

Select one course from Western culture, one from non-Western culture, and one from U.S. minority culture from campus approved lists. 9

Foreign Language

Coursework at or above the third level is required for graduation.

Quantitative Reasoning I

Select one of the following: 4-5

- MATH 220 Calculus
- MATH 221 Calculus I
- MATH 234 Calculus for Business I

Quantitative Reasoning II

CPSC 241 Intro to Applied Statistics 3

Natural Sciences and Technology

See Specific Concentration Requirements

Humanities and the Arts

Select from campus approved list 6

Social and Behavioral Sciences

ACE 100 Agr Cons and Resource Econ 1 3-4

or ECON 102 Microeconomic Principles

Select from campus approved list. 3-4

ACES required

ACES 101 Contemporary Issues in ACES 2

Required Concentration 58-79

Concentration prescribed courses. See specific requirements for each concentration listed below.

Total Hours 126

Approved Concentrations:

- Horticultural Food Systems Concentration (http://catalog.illinois.edu/undergraduate/aces/departments/crop-sci/horticultural-food-systems-concentration)
- Plant Biotechnology and Molecular Biology Concentration (http://catalog.illinois.edu/undergraduate/aces/departments/crop-sci/plant-biotechnology-molecular-biology-concentration)
- Plant Protection Concentration (http://catalog.illinois.edu/undergraduate/aces/departments/crop-sci/integrated-pest-management-concentration)

1 ACE 100 or ECON 102 are not required for the Biological Sciences Concentration.

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

Courses

CPSC 102 Research in Crop Sciences credit: 1 Hour. (https://courses.illinois.edu/schedule/terms/CPSC/102)
Introduces students to opportunities and topics for research in crop sciences including in the lab, field, and greenhouse; introduces research procedures such as how to maintain a laboratory notebook, basic experimental design and analysis, and exploring scientific literature; and provides students training in both research safety and ethics. Approved for S/U grading only. 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 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.

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

CPSC 113 Environment, Agric, & 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)
Same as HORT 180. See HORT 180.

CPSC 190 African American Food Systems credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/CPSC/190)
Introduces students to the many foods commonly considered American that are in fact African in origin; explores the neglected story of how people, crops, and knowledge from Africa were transplanted into the New World; examines the historical, cultural, and agricultural roots of African American food systems; and evaluates the scientific (physical and social) and cultural aspects of these food systems to understand the origins, evolution, and contributions of African American food culture.

CPSC 199 Undergraduate Open Seminar credit: 0 to 5 Hours. (https://courses.illinois.edu/schedule/terms/CPSC/199)
Experimental course on a special topic in crop sciences. Topic may not be repeated except in accordance with the Code. Approved for Letter and S/U grading. May be repeated up to a maximum of 12 hours in separate terms if topics vary.

CPSC 213 Evolution in Action credit: 2 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 have influences 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 226 Introduction to Weed Science credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/CPSC/226)
Fundamentals of weed biology, ecology, and management. Emphasis is placed on basic principles and specific management strategies that are relevant to both crop and non-crop ecosystems. Includes a laboratory/discussion. Same as HORT 226. Prerequisite: CPSC 112 or HORT 100 or IB 103.

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. Same as HORT 261. 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. 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.
The principles and structure of carbohydrates, proteins, and nucleic acids will be discussed. An overview of the structure, properties, and reactions of carbon-based substances will also be covered. The chemistry of hydrocarbons, aromatic compounds, and oxygen-containing molecules will be examined. Students will develop a working understanding of the environmental science principles and strategies (technical, economic, and social) that can be used to improve environmental quality. Students will learn how to diagnose real-world problems in fields and crops, how pests (insects, weeds, plant diseases, and vertebrates) interact, and how crops and soils interact. Students will learn the fundamentals in crop development and management, soil structure, fertility, and how crops and soils interact. Students will also learn about the implementation of new technology and strategies to tackle such problems. Students will be prepared to be competitive in careers within commercial crop agriculture and to pass the Certified Crop Adviser examination. 3 undergraduate hours. 3 graduate hours. Offered in alternate years. Prerequisite: Junior standing, admission to the ACES Honors Program, and consent of instructor.

For Online MS Program.

Examination 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 environmental management strategies (technical, economic, and social) that can be used to improve environmental quality. Students will learn about the fundamentals in crop development and management, soil structure, fertility, and how crops and soils interact. Students will learn how to diagnose real-world problems in fields and crops, how pests (insects, weeds, plant diseases, and vertebrates) interact, and how crops and soils interact. Students will learn the fundamentals in crop development and management, soil structure, fertility, and how crops and soils interact. Students will also learn about the implementation of new technology and strategies to tackle such problems. Students will be prepared to be competitive in careers within commercial crop agriculture and to pass the Certified Crop Adviser examination. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 226 or CPSC 270 or equivalent, both are preferred but only 1 is required.

Students will learn about the fundamentals in crop development and management, soil structure, fertility, and how crops and soils interact. Students will learn how to diagnose real-world problems in fields and crops, how pests (insects, weeds, plant diseases, and vertebrates) interact, and how crops and soils interact. Students will learn the fundamentals in crop development and management, soil structure, fertility, and how crops and soils interact. Students will also learn about the implementation of new technology and strategies to tackle such problems. Students will be prepared to be competitive in careers within commercial crop agriculture and to pass the Certified Crop Adviser examination. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 112 and NRES 201, or equivalent, or consent of instructor.

Advanced course in the complex interactions of food production resulting from different agricultural systems and the environment. Students will learn about the fundamentals in crop development and management, soil structure, fertility, and how crops and soils interact. Students will learn how to diagnose real-world problems in fields and crops, how pests (insects, weeds, plant diseases, and vertebrates) interact, and how crops and soils interact. Students will learn the fundamentals in crop development and management, soil structure, fertility, and how crops and soils interact. Students will also learn about the implementation of new technology and strategies to tackle such problems. Students will be prepared to be competitive in careers within commercial crop agriculture and to pass the Certified Crop Adviser examination. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 112 or CPSC 113 or equivalent course or consent of instructor.

For Online MS Program.

For Online MS Program.

For Online MS Program.

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For Online MS Program.
CPSC 416  Native Plants and Agroecosystems  credit: 4 Hours. (https://courses.illinois.edu/schedule/terms/CPSC/416) Introduction to native plants and to their conservation use and agronomic benefit. Topics include learning to identify native plants using a regional flora, knowing the different ecological niches in the state of Illinois and which plants inhabit them, and choosing appropriate native plants to enhance the interaction between agronomic crops and natives. 4 undergraduate hours. 4 graduate hours. Credit is not given for CPSC 416 if credit for NRES 415 has been earned. Prerequisite: HORT 100 or IB 103.

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. 3 undergraduate hours. 3 graduate hours. Prerequisite: CPSC 226 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. 2 undergraduate hours. 2 graduate hours. Prerequisite: CPSC 226 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 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 ABE 440, ANSC 440, FSHN 440, and NRES 440. 4 undergraduate hours. 4 graduate hours. Prerequisite: MATH 112 or equivalent.

CPSC 448  Biological Modeling  credit: 3 or 4 Hours. (https://courses.illinois.edu/schedule/terms/CPSC/448) Same as ANSC 449, GEOG 468, and IB 491. See GEOG 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. Same as HORT 453. 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 462  Plant Molecular Biology  credit: 1 Hour. (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)
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. Same as IB 477. 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)
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)
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)
Same as IB 483. See IB 483.

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

CPSC 484  Plant Physiology  credit: 3 Hours. (https://courses.illinois.edu/schedule/terms/CPSC/484)
Same as IB 420. See IB 420.

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 and IS 483. See INFO 491.

CPSC 498  Crop Sci Professional Develpmnt  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  Seminar  credit: 1 to 4 Hours. (https://courses.illinois.edu/schedule/terms/CPSC/499)
Group discussion or an experimental course on a special topic in crop sciences. Approved for both letter and S/U grading. May be repeated to a maximum of 12 hours.