

Crop Science (CPSC)

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Opportunities for employment and post-graduate study are numerous for graduates of the Department of Crop, Soil, and Environmental Sciences. Crop Science graduates become involved in crop production or find employment in public agencies providing support services for agriculture (e.g., Extension Service, State Plant Board, Natural Resources Conservation Service), or as consultants serving production agriculture, in the agrichemical and seed industries, and in agricultural research programs.

The crop science major includes courses in crop management, production agriculture, plant breeding and genetics, crop and forage production, pest management (weeds, insects, and plant diseases), and soil fertility.

Requirements for a Major in Crop Science (CPSC)

State minimum core (<http://catalog.uark.edu/undergraduatecatalog/gened/stateminimum/>) and discipline specific general education requirements (<http://catalog.uark.edu/undergraduatecatalog/gened/generaleducation/>).

(Course work that meets state minimum core requirements is in bold.)

University Requirements **2**

| | |
|------------|---|
| UNIV 10051 | University Perspectives ¹ |
| CSES 10101 | Introduction to Crop, Soil, and Environmental Science |

Communications **12**

| | |
|------------|--|
| ENGL 10103 | Composition I (ACTS Equivalency = ENGL 1013) |
| ENGL 10203 | Composition II (ACTS Equivalency = ENGL 1023) |
| SPCH 10003 | Public Speaking (ACTS Equivalency = SPCH 1003) |

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| CSES 30203 | Crop, Soil, and Environmental Sciences Colloquium |
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U.S. History or Government ² **3**

Select 3 hours US History or Government State Minimum Core

Mathematics and Computer Science **6**

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|------------|--|
| MATH 11003 | College Algebra (ACTS Equivalency = MATH 1103) (or higher level MATH) |
| ASTM 29003 | Agricultural and Human Environmental Sciences Applications of Microcomputers |
| | or MATH 21003 Principles of Statistics (ACTS Equivalency = MATH 2103) |

Physical and Biological Sciences **15-19**

| | |
|-------------------------|--|
| BIOL 10103 & BIOL 10101 | Principles of Biology (ACTS Equivalency = BIOL 1014 Lecture) and Principles of Biology Laboratory (ACTS Equivalency = BIOL 1014 Lab) |
| CHEM 26103 & CHEM 26101 | Organic Physiological Chemistry (ACTS Equivalency = CHEM 1224 Lecture) and Organic Physiological Chemistry Laboratory (ACTS Equivalency = CHEM 1224 Lab) |
| ANSC 31203 | Principles of Genetics |

or POSC 31203 Principles of Genetics

or BIOL 23373 General Genetics

Select one CHEM group (4-8 hours)

CHEM 12103 Fundamentals of Chemistry (ACTS Equivalency = CHEM 1214 Lecture) and Fundamentals of Chemistry Laboratory (ACTS Equivalency = CHEM 1214 Lab)

CHEM 14103 University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture) & CHEM 14203 and University Chemistry I Laboratory (ACTS Equivalency = CHEM 1414 Lab) and University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture) and University Chemistry II Laboratory (ACTS Equivalency = CHEM 1424 Lab)

Fine Arts and Humanities ² **6**

Select 3 hours from Fine Arts State Minimum Core

Select 3 hours from Humanities State Minimum Core

Social Sciences ² **9**

AGEC 11003 Principles of Agricultural Microeconomics

Select 6 hours from Social Sciences State Minimum Core

Crop Science Core **29**

CSES 23002 Professional Development in Crop, Soil, and Environmental Sciences

CSES 12003 Introduction to Plant Sciences

CSES 21033 Crop Science & CSES 21001 and Crop Science Laboratory

CSES 22003 Soil Science & CSES 22001 and Soil Science Laboratory

CSES 40133 Advanced Crop Science

CSES 42204 Soil Fertility

CSES 41403 Principles of Weed Control

ENTO 30103 Introduction to Entomology

PLPA 30003 Principles of Plant Pathology

Crop Science Electives ³ **21**

Select Twenty-One (21) hours from the following:

CSES 32104 Soil Resources and Nutrient Cycles

CSES 33102 Cotton Production

CSES 33202 Soybean Production

CSES 33302 Rice Production

CSES 33402 Cereal Grain Production

CSES 37003 Precision Agriculture for Crops

ENSC 30003 Introduction to Water Science

ENSC 32603 Soil and Water Conservation

ENSC 36003 GIS for Environmental Science

CSES 41003 Plant Breeding

CSES 41303 Ecology and Morphology of Weedy and Invasive Plants

ENTO 41203 Insect Pest Management

PLPA 42203 Plant Disease Control

PLPA 43303 Biotechnology in Agriculture

CSES 4620V Internship (3 hours)

CSES 4000V Special Problems (3 hours)

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|--------------------------|--------------|
| General Electives | 13-17 |
| Total Hours | 120 |

¹ UNIV 10051 University Perspectives is required for new freshmen or transfers with less than 24 hours.

² See student degree audit for approved course list.

³ One 3-hour study abroad course may be used in fulfilling 3 hours of Crop Science electives.

Crop Science B.S.A. Eight-Semester Degree Program

See more about the Eight-Semester Degree Policy (<http://catalog.uark.edu/undergraduatecatalog/academicregulations/eightsemesterdegreecompletionpolicy/>) for university requirements of the program.

| First Year | Units | |
|--|-------|--------|
| | Fall | Spring |
| ENGL 10103 Composition I (ACTS Equivalency = ENGL 1013) (Satisfies General Education Outcome 1.1) | 3 | |
| MATH 11003 College Algebra (ACTS Equivalency = MATH 1103) (or higher level MATH (Satisfies General Education Outcome 2.1)) | 3 | |
| Satisfies General Education Outcome 3.4: | | |
| BIOL 10103 Principles of Biology (ACTS Equivalency = BIOL 1014 Lecture) & BIOL 10101 Principles of Biology Laboratory (ACTS Equivalency = BIOL 1014 Lab) | 4 | |
| CSES 12003 Introduction to Plant Sciences | 3 | |
| UNIV 10051 University Perspectives | 1 | |
| CSES 10101 Introduction to Crop, Soil, and Environmental Science | 1 | |
| CSES 21033 Crop Science & CSES 21001 Crop Science Laboratory | | 4 |
| ENGL 10203 Composition II (ACTS Equivalency = ENGL 1023) (If exempt, see adviser for communication courses.) (Satisfies General Education Outcome 1.1) | | 3 |
| SPCH 10003 Public Speaking (ACTS Equivalency = SPCH 1003) (Satisfies General Education Outcomes 1.2 and 5.1) | | 3 |
| AGEC 11003 Principles of Agricultural Microeconomics (Satisfies General Education Outcome 3.3) | | 3 |
| U.S. History or Government Core Elective (Satisfies General Education Outcome 4.2) ⁵ | | 3 |
| Year Total: | 15 | 16 |

| Second Year | Units | |
|---|-------|--------|
| | Fall | Spring |
| Satisfies General Education Outcome 3.4: | | |
| CHEM 14103 University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture) & CHEM 14101 University Chemistry I Laboratory (ACTS Equivalency = CHEM 1414 Lab) or CHEM 12103 and CHEM 12101 | 4 | |

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| Social Sciences State Minimum Core Elective (Satisfies General Education Outcome 3.3) ⁴ | 3 | |
| Fine Arts or Humanities State Minimum Core Elective (Satisfies General Education Outcome 3.1 or 3.2) ^{1, 2} | | 3 |
| Crop Science Elective ^{4,5} | | 3 |
| Crop Science Elective ^{4,5} | 2-3 | |
| CSES 23002 Professional Development in Crop, Soil, and Environmental Sciences | | 2 |
| CHEM 14203 University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture) & CHEM 14201 University Chemistry II Laboratory (ACTS Equivalency = CHEM 1424 Lab) or CHEM 26103 and CHEM 26101 | | 4 |
| ASTM 29003 Agricultural and Human Environmental Sciences Applications of Microcomputers | | 3 |
| or MATH 21003 Principles of Statistics (ACTS Equivalency = MATH 2103) | | |
| Social Sciences State Minimum Core Elective (Satisfies General Education Outcomes 3.3 and 4.1) ⁴ | | 3 |
| Fine Arts or Humanities State Minimum Core Elective (Satisfies General Education Outcome 3.1 or 3.2) ^{1, 2} | | 3 |
| Crop Science Elective ^{4,5} | 2-3 | |
| Year Total: | 17 | 16 |

| Third Year | Units | |
|---|-------|--------|
| | Fall | Spring |
| CHEM 26103 Organic Physiological Chemistry (ACTS Equivalency = CHEM 1224 Lecture) & CHEM 26101 Organic Physiological Chemistry Laboratory (ACTS Equivalency = CHEM 1224 Lab) or CHEM 14203 and CHEM 14201 | 4 | |
| PLPA 30003 Principles of Plant Pathology | 3 | |
| ENTO 30103 Introduction to Entomology | 3 | |
| CSES 22003 Soil Science & CSES 22001 Soil Science Laboratory | 4 | |
| ANSC 31203 Principles of Genetics or POSC 31203 Principles of Genetics or BIOL 23373 General Genetics | | 3 |
| Crop Science Elective ^{4,5} | | 2-3 |
| Crop Science Elective ^{4,5} | | 3 |
| General Elective ⁴ | | 6 |
| Year Total: | 14 | 14 |

| Fourth Year | Units | |
|--|-------|--------|
| | Fall | Spring |
| CSES 30203 Crop, Soil, and Environmental Sciences Colloquium (Satisfies General Education Outcome 6.1) | 3 | |
| CSES 42204 Soil Fertility | 4 | |
| Crop Science Elective ^{4,5} | 3 | |
| Crop Science Elective ^{4,5} | 2-3 | |
| Crop Science Elective ^{4,5} | 3 | |

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| CSES 40133 Advanced Crop Science | 3 |
| CSES 41403 Principles of Weed Control | 3 |
| Crop Science Electives OR General Electives ² | 0-7 |
| Year Total: | 16 12 |

Total Units in Sequence: 120

¹ The Fine Arts Elective courses which satisfy General Education Outcome 3.1 include: ARCH 10003, ARHS 10003, COMM 10003, DANC 10003, LARC 10003, MUSC 10003, MUSC 100H3, MUSC 10103, MUSC 101H3, MUSC 13303, THTR 10003, THTR 10103, or THTR 100H3.

² The Humanities Elective courses which satisfy General Education Outcome 3.2 include:
AAST 20203, ANTH 10303, ARCH 10103, CLST 10003, CLST 100H3, CLS or Intermediate-level world language (usually 2003-level).

³ The Social Science Elective courses which satisfy General Education Outcomes 3.3 and 4.1 include: ANTH 10203, COMM 10203, HDFS 14003, HDFS 24103, HIST 11193, HIST 111H3, HIST 11293, HIST 112H3, HIST 20903, HUMN 111H4, HUMN 211H4, INST 28103, INST 281H3, PLSC 20103, PLSC 28103, PLSC 281H3, RESM 28503, SOCI 10103, SOCI 101H3, or SOCI 20103.

⁴ Students must complete 40 hours of upper division courses (3000-4000 level). It is recommended that students consult with their academic adviser when making course selections.

⁵ See student degree audit for approved course list.

Minor in Crop Science (CPSC-M)

A student planning to minor in Crop Science must notify the program adviser for consultation and more detailed information. The Crop Science Minor consists of 18 semester hours of 2000-level courses or above, including the following:

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| CSES 21033 | Crop Science | 3 |
| CSES 22003 | Soil Science | 3 |
| Select 12 hours with at least 4 hours coming from Group A: | | 12 |
| Group A | | |
| CSES 33102 | Cotton Production | |
| CSES 33202 | Soybean Production | |
| CSES 33302 | Rice Production | |
| CSES 33402 | Cereal Grain Production | |
| Group B | | |
| CSES 32104 | Soil Resources and Nutrient Cycles | |
| CSES 40133 | Advanced Crop Science | |
| CSES 41003 | Plant Breeding | |
| CSES 41303 | Ecology and Morphology of Weedy and Invasive Plants | |
| CSES 41403 | Principles of Weed Control | |
| CSES 42204 | Soil Fertility | |
| Total Hours | | 18 |

Minor in Crop Biotechnology (CPBT-M)

A student planning to minor in Crop Biotechnology must notify the program adviser for consultation and more detailed information. The Crop Biotechnology Minor consists of 16 hours of courses and to include the following:

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|---------------------|------------------------------|---|
| Core Courses | | |
| PLPA 43303 | Biotechnology in Agriculture | 3 |
| CSES 41003 | Plant Breeding | 3 |

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| Genetics | | |
| CSES 4000V | Special Problems (two 2-hour courses taken in two different semesters) | 4 |

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| Select one of the following: 3 | | |
| BIOL 23373 | General Genetics | |
| ANSC/POSC 31203 | Principles of Genetics | |

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| Controlled Electives | | |
| Select one from the following: 3 | | |
| CHEM 38103 | Elements of Biochemistry | |

| | | |
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| CSES 37003 | Precision Agriculture for Crops | 1193, HIS |
| BENG 31103 | Measurement and Control for Biological Systems | |
| BENG 41203 | Biosensors & Bioinstrumentation | |
| BIOL 25473 | Cell Biology | |
| BIOL 42373 | Genomics and Bioinformatics | |
| BIOL 45803 | Genetic Engineering | |

Total Hours 16

Faculty

Barber, Thomas, Ph.D., M.S., B.S. (University of Arkansas), Professor, 2007, 2016.

Bourland, Fred, Ph.D. (Texas A&M University), M.S., B.S.A. (University of Arkansas), Professor, 1988.

Brye, Kristofor R., Ph.D., M.S. (University of Wisconsin-Madison), B.S. (University of Wisconsin-Stevens Point), University Professor, 2001, 2020.

Burgos, Nilda Roma, Ph.D., M.S. (University of Arkansas), B.S. (Visayas State College of Agriculture-Philippines), Professor, 1998, 2010.

Counce, Paul Allen, Ph.D. (University of Georgia), M.S. (Purdue University), B.S. (University of Tennessee-Martin), Professor, 1983, 2003.

Daniels, Michael B., Ph.D., M.S. (University of Arkansas), B.S. (Pennsylvania State University), Professor, 1996, 2006.

Davis, Jason, Ph.D., M.S., B.S. (University of Arkansas), Assistant Professor, 2024.

De Guzman, Christian T., Ph.D. (Louisiana State University), B.S. (University of Philippines, Los Banos), Assistant Professor, 2020.

Elli, Elvis, Ph.D. (Universidade de Sao Paulo), M.S., B.S. (Universidade Federal de Santa Maria), Assistant Professor, 2023.

Fernandez, Samuel, Ph.D., M.S. (Universidade de Lavras), B.S. (Universidade de Brasilia), Assistant Professor, 2022.

Finch, Bronc, Ph.D. (Oklahoma State University) M.S., B.S. (West Texas A&M University), Assistant Professor, 2023.

Greub, Kelsey, Ph.D. (University of Arkansas), M.S. (Auburn University), B.S. (Texas A&M University), Instructor, 2023.

Hardke, Jarrod T., Ph.D. (Louisiana State University), B.S.A. (University of Arkansas), Professor, 2013, 2020.

Kelley, Jason, Ph.D., M.S. (Oklahoma State University), B.S. (Kansas State University), Professor, 2003, 2019.

Miller, David M., Ph.D. (University of Georgia), M.S., B.S. (Purdue University), Professor, 1988, 2001.

Norsworthy, Jason Keith, Ph.D., M.S. (University of Arkansas), B.S. (Louisiana Tech University), Distinguished Professor, 2006, 2019.

Pereira, Andy, Ph.D. (Iowa State University), M.S. (Indian Agricultural Research Institute, India), B.Sc.Ag. (Govind Ballabh Pant University of

Agriculture and Technology, India), Professor, Anheuser-Busch and Arkansas Wholesalers Professorship in Molecular Genetics, 2011.

Poncet, Aurelie, Ph.D. (Auburn University), M.S. (Montpellier SupAgro, France), M.S. Minor: (AgroTIC), B.S. (Montpellier SupAgro, France), Assistant Professor, 2020.

Roberts, Trenton L., Ph.D. (University of Arkansas), M.S. (University of Arizona), B.S. (Oklahoma State University), Associate Professor, 2010, 2022.

Ross, Jeremy, Ph.D., M.S., B.S. (University of Arkansas), Professor, 1996, 2017.

Scott, Robert C., Ph.D. (Mississippi State University), M.S., B.S. (Oklahoma State University), Professor, 2002, 2008.

Sha, Xueyan, Ph.D. (Louisiana State University), Professor, 2012.

Shakiba, Ehsan, Ph.D., M.S. (University of Arkansas), M.S., B.S. (Azad University, Iran), Assistant Professor, 2015.

Skinner, Jerral V., Ph.D. (University of Arkansas), Lecturer, 1990.

Slaton, Nathan A., Ph.D., M.S. (University of Arkansas), B.S. (Murray State University), Professor, 2001, 2009.

Speir, Shannon, Ph.D. (University of Notre Dame), M.S. (University of Arkansas), B.S. (Texas Christian University), Assistant Professor, 2022.

Srivastava, Vibha, Ph.D. (Jawaharlal Nehru University, New Delhi), M.S. (Govind Ballabh Pant University of Agriculture and Technology), B.S. (D.E.I. University), Professor, 2001, 2012.

Vieira, Caio, Ph.D., M.S. (University of Missouri-Columbia) B.S. (Universidade de Sao Paulo), Assistant Professor, 2023.

Wood, Lisa S., Ph.D., M.S., B.S. (University of Arkansas), Clinical Associate Professor, 2012, 2019.

Courses

CSES 10101. Introduction to Crop, Soil, and Environmental Science. 1 Hour.

An introduction to the CSES department and majors in Environmental Soil and Water Sciences and Crop Management. Emphasis will be placed on issues and opportunities within these disciplines and orienting students to the department and University of Arkansas. Required of all department majors with less than 24 semester credit hours. Offered second eight weeks of the semester. Prerequisite: Freshman and sophomore standing only. (Typically offered: Fall)

CSES 12003. Introduction to Plant Sciences. 3 Hours.

An introduction to basics of agricultural crop plant structure, growth, and production. (Typically offered: Fall and Spring)

CSES 20103. Pest Management. 3 Hours.

Introduction to basic principles of pest management as they relate to vertebrate animals, insects, plant disease and weeds. Selected pests are studied with emphasis on current management approaches and alternative pest control. (Typically offered: Spring)

CSES 21001. Crop Science Laboratory. 1 Hour.

A series of laboratory experiments designed to reinforce principles of plant growth and development, reproduction, classification, and the utilization of plant products. Emphasis is placed on major crop plant species. Experiments are conducted by individuals or by teams. Laboratory consists of a single, 2-hour period each week. Required for Crop Management majors. Corequisite: CSES 21033. (Typically offered: Spring)

CSES 21033. Crop Science. 3 Hours.

Principles of crop growth, development, and utilization and how these principles relate to production. Emphasis on major agronomic crop species. Lecture 3 hours per week. (Typically offered: Spring)

CSES 22001. Soil Science Laboratory. 1 Hour.

Field and laboratory exercises related to the study of the physical, chemical, and biological properties of soils. Laboratory mandatory for all crop management and environmental, soil, and water science majors and optional for others. Laboratory 2 hours per week. Pre- or Corequisite: CSES 22003. (Typically offered: Fall and Spring)

CSES 22003. Soil Science. 3 Hours.

Origin, classification, and physical, chemical, and biological properties of soils. Lecture 3 hours, discussion 1 hour per week. Corequisite: Drill component. Prerequisite: MATH 11003 or higher (to include MATH 12003, MATH 13004, MATH 15104, MATH 22103, MATH 22003, MATH 20503, MATH 24005, MATH 25104, MATH 24004, MATH 25004, or MATH 26004) and CHEM 14103 or CHEM 12103. (Typically offered: Fall and Spring)

CSES 23002. Professional Development in Crop, Soil, and Environmental Sciences. 2 Hours.

This course is designed to prepare students majoring in Crop Science or Environmental, Soil, and Water Sciences to enter a career in a related field or begin graduate school after completing their undergraduate degree. Topics covered include creating a job application, professional behavior, interview skills, writing a scientific literature review, and delivering a professional presentation related to crop, soil, or environmental science. (Typically offered: Fall)

CSES 30203. Crop, Soil, and Environmental Sciences Colloquium. 3 Hours.

A communication-intensive course covering topics in agronomy and environmental, soil, and water science with particular emphasis on spoken communication but also including written communication, group activities, professionalism, ethics, problem solving, and information retrieval. A student-oriented class with collaborative participation. Colloquium workshop: 3 hours per week. Prerequisite: SPCH 10003 and Junior or Senior standing only. (Typically offered: Fall)

CSES 32104. Soil Resources and Nutrient Cycles. 4 Hours.

Integration of the fundamental concepts of the biological, chemical, and physical properties of soil systems and their roles in managing soil resources. Lecture 3 hours, laboratory 3 hours per week. Pre- or Corequisite: BIOL 20003 and BIOL 20001. Corequisite: Lab component. Prerequisite: CSES 22003. (Typically offered: Spring Odd Years)

CSES 33102. Cotton Production. 2 Hours.

Principles and techniques associated with production of cotton. Recitation 2 hours per week. Prerequisite: CSES 12003 or CSES 21033. (Typically offered: Fall Even Years)

CSES 33202. Soybean Production. 2 Hours.

An overview of the history and utilization of soybean as well as the physiological and environmental basis for the development of economical soybean production practices. Recitation 2 hours per week. Prerequisite: CSES 12003 or CSES 21033. (Typically offered: Spring Odd Years)

CSES 33302. Rice Production. 2 Hours.

A study of the principles and practices involved in rice culture worldwide with major emphasis on the United States. Recitation 2 hours per week. Prerequisite: CSES 12003 or CSES 21033. (Typically offered: Fall Odd Years)

CSES 33402. Cereal Grain Production. 2 Hours.

An overview of the botany, production, cultural practices, soil & climatic adaptation and utilization of the major cereal grain crops. Prerequisite: CSES 12003 or CSES 21033. (Typically offered: Spring Even Years)

CSES 35501. Soil Profile Description. 1 Hour.

Training for soil profile description writing and membership of judging teams. (Typically offered: Fall) May be repeated for up to 8 hours of degree credit.

CSES 37003. Precision Agriculture for Crops. 3 Hours.

This course will provide students with a practical understanding of precision agriculture and crop/ecosystem monitoring with remote and proximal sensing technology. Prerequisite: MATH 11003 and CSES 12003. (Typically offered: Spring)

CSES 4000V. Special Problems. 1-6 Hour.

Work on special problems in crop, soil and environmental sciences or related field. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CSES 40133. Advanced Crop Science. 3 Hours.

Fundamental concepts of crop physiology, crop improvement, seed science, and crop production systems. Recitation 3 hours per week. Prerequisite: CSES 21033 and CSES 22003. (Typically offered: Spring)

CSES 4020V. Special Topics. 1-3 Hour.

Studies of selected topics in crop, soil and environmental sciences not available in other courses. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

CSES 41003. Plant Breeding. 3 Hours.

This course aims to provide students with an extensive background in plant breeding applied to cultivar development, including but not limited to understanding the foundations of plant breeding, modes of reproduction in plants, various breeding methods, and introduction to quantitative genetics. Prerequisite: ANSC 31203 or BIOL 23373. (Typically offered: Fall)

CSES 41303. Ecology and Morphology of Weedy and Invasive Plants. 3 Hours.

Study of weeds as economic pests occurring in both agricultural and nonagricultural situations and including poisonous plants and other specific weed problems. Gross morphological plant family characteristics which aid identification, habitat of growth and distribution, ecology, competition, and allelopathy are discussed. Lecture 2 hours, laboratory 2 hours a week. Corequisite: Lab component. Prerequisite: CSES 21033 or HORT 20003. (Typically offered: Fall)

CSES 41403. Principles of Weed Control. 3 Hours.

Advanced concepts and technology used in modern weed control practices and study of the chemistry and specific activity of herbicides in current usage. Lecture 2 hours, laboratory 2 hours per week. Corequisite: Lab component. Prerequisite: CHEM 12103 and CHEM 12101. (Typically offered: Spring)

CSES 42204. Soil Fertility. 4 Hours.

Study of the soil's chemical, biological and physical properties, and human modification of these properties, as they influence the uptake and utilization of the essential nutrients by plants. Lecture 3 hours, laboratory 2 hours per week. Pre- or Corequisite: CHEM 14203 and CHEM 14201 or (CHEM 12103 and CHEM 12101 and CHEM 26103 and CHEM 26101). Corequisite: Lab component. Prerequisite: CSES 22001 and CSES 22003. (Typically offered: Fall)

CSES 42503. Soil Classification and Genesis. 3 Hours.

Lecture and field evaluation of soil properties and their relation to soil genesis and soil classification with emphasis on soils of Arkansas. Lecture 2 hours, laboratory 2 hours per week. Corequisite: Lab component. Prerequisite: CSES 22003 and CSES 22001. (Typically offered: Fall Odd Years)

CSES 45503. Wetland Soils. 3 Hours.

This course explains the chemical, physical, and morphological characteristics of wetland soils and describes the techniques for identifying wetland soils using field indicators and monitoring equipment. This course also explains principles of wetland creation, restoration, and mitigation - all key components in assuring the sustainability of valuable wetland resources. Prerequisite: (CSES 22003 and CSES 22001) or CSES 35501. (Typically offered: Spring Odd Years)

CSES 4620V. Internship. 1-6 Hour.

Supervised practical work experience in agronomy and environmental science to develop and demonstrate professional competence. Faculty approval of project proposal prior to enrollment and written and oral reports after the project is complete are required. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.