

Admission Requirements For This Major

1. New freshmen admitted to USU in good standing qualify for admission to this major.
2. Transfer students from other institutions need a 2.2 transfer GPA and students transferring from other USU majors need a 2.0 total GPA in courses required for this major to be accepted in good standing in Crop Science.

The Program

The requirements for the **Crop Science Major** are designed to prepare students for a career related to the production of agronomic crops. This major will allow a student to function well in a rapidly changing technological environment and to acquire new skills and understanding as his or her career evolves. Each of the emphases within this major have been designed to allow students flexibility to add courses or a minor to meet their own unique goals.

The **Agronomy Emphasis** is designed for students interested in learning more about applied aspects of crop production. Some courses emphasize production techniques and systems, while others provide students with an understanding of principles underlying crop production.

The **Research/Biotechnology Emphasis** is designed for students who wish to participate in the development of plant-oriented technologies at any level of employment, and for those who intend to pursue a career in private or public research requiring graduate degrees. Courses provide the fundamental tools for a twenty-first century career in agriculture.

This is an exciting time to choose careers in crop science. There is demand for economically competitive, sustainable agricultural systems that use emerging technologies to continue to provide safe, affordable, and nutritious food supplies. An undergraduate degree in Crop Science can provide the foundation for a wide spectrum of careers, from agricultural production to genetic engineering.

Career Opportunities

The **Agronomy Emphasis** prepares students for careers such as owning or managing farm-related businesses, consulting, or agricultural product sales. Students who are considering careers in agribusiness may also wish to complete an agricultural economics or agribusiness management minor. Completion of ARCPACS-recommended courses plus five years of work experience will allow a student to gain professional certification as an Agronomist, a Crop Scientist, or a Crop Specialist through the American Registry of Certified Professionals in Agronomy, Crops, and Soils (ARCPACS). For further information about ARCPACS requirements, see page 4 of this requirement sheet.

Fundamental, long-term gains in crop production will be made by scientists who not only understand the complexities of emerging technologies, but who also appreciate challenges faced by those currently in agricultural production. Completion of the **Research/Biotechnology Emphasis** as a terminal degree will prepare a student for entry-level technical positions, particularly in agriculturally-oriented research companies, chemical firms, or government agencies. Students completing this emphasis will also be well-prepared to enter any graduate program in the life sciences or to gain admittance to other science-oriented professional schools. This emphasis provides a strong foundation in the physical sciences.

Degrees and Certificates Offered Through This Department

Bachelor of Science (BS):

- Crop Science
- Horticulture
- Environmental Soil/Water Science

Master of Science (MS) and Doctor of Philosophy (PhD):

- Plant Science
- Soil Science
- Biometeorology
- Ecology

Master of Professional Studies in Horticulture (MPSH)

Associate of Applied Science (AAS) and One-year Certificate:

- Ornamental Horticulture

Graduation Requirements: BS Degree in Crop Science

Minimum University Requirements*

Total credits	120
Grade point average (most majors require higher GPA)	2.00 GPA
Credits of C- or better	100
Credits of upper-division courses (#3000 or above)	40
USU credits	30
(20 of which must be upper division, including 10 required by major)	
Completion of approved major program of study	See department
Credits in minor (if required by department)	12
Credits in American Institutions (ECON 1500; HIST 1700, 2700, or 2710; POLS 1100; or USU 1300).	3
University Studies requirements	See below

*Colleges and departments may require more credits or a higher GPA. See requirements on this sheet.

University Studies Requirements for Crop Science Major

Note: Approved University Studies courses and requirements are listed in the back section of each semester's *Schedule of Classes*.

General Education Requirements (30-34 credits)

Competency Requirements (9-10 credits)

Communications Literacy (CL1 and CL2) (6 credits)

ENGL 1010 (CL1) (3 credits) or satisfactory AP, CLEP, IBO, ACT, or SAT score

AND

ENGL 2010 (CL2) (3 credits) or satisfactory IBO score

Quantitative Literacy (QL) (3-4 credits)

MATH 1030 or 1050 or STAT 1040 (3-4 credits)

OR

One MATH or STAT course requiring MATH 1050 as a prerequisite

OR

Satisfactory AP, CLEP, IBO, ACT, or SAT score

Computer and Information Literacy (0 credits)

Passing grade on six computer and information literacy related examinations.

Breadth Requirements (18-20 credits)

Select at least one approved course from each of the following six categories: **American Institutions (BAI)**, **Creative Arts (BCA)**, **Humanities (BHU)**, **Life Sciences (BLS)**, **Physical Sciences (BPS)**, and **Social Sciences (BSS)**. At least two of the six breadth courses must be University Studies courses with a **USU prefix** (excluding USU 1000, 1010, 1100, 3330, 4900, and 6900). (CLEP or AP credit may be used.) BIOL 1620 will fulfill the Life Sciences requirement and CHEM 1110, 1120, or 1220 will fulfill the Physical Sciences requirement for students in the Crop Science major.

Exploration Requirement (3-4 credits)

Choose an additional class from one of the following General Education categories: QL, BAI, BCA, BHU, BLS, BPS, or BSS.

Depth Education Requirements

Communications Intensive (CI) (2 courses)

PSC 3890 and 4890 will meet this requirement.

Quantitative Intensive (QI) (1 course)

For students in the **Agronomy** emphasis, BIOL 3060, PLSC 4600, or SOIL 5550 will meet this requirement. For students in the **Research/Biotechnology** emphasis, BIOL 3060 will meet this requirement.

Depth Course Requirements (4 credits minimum, including 2 credits minimum completed in each of two courses)

Complete at least 2 credits in *approved* 3000-level or above courses from each of the following two categories: **Humanities and Creative Arts (DHA)** and **Social Sciences (DSS)**.

Department Requirements

All courses used to fulfill major requirements must be taken for a grade of *A-B-C-D-F* and not *Pass/Fail*. A 2.5 GPA is required for all courses used to fulfill major requirements (i.e., Core and Emphasis requirement). At least 12 credits of the major must be taken in residence.

Note: Effective Summer Semester 2006, some course numbers changed, due to House Bill 320 (Common Course Numbering). Course numbers used *prior to* Summer Semester 2006 are shown in parentheses, following *formerly*.

Crop Science Major Core Courses (29 credits)

All Crop Science majors must complete the following courses:

	Credits
<input type="checkbox"/> BIOL 1610 Biology I (F)	4
(formerly BIOL 1210)	
<input type="checkbox"/> BIOL 1620 (BLS) Biology II (Sp)	4
(formerly BIOL 1220)	
<input type="checkbox"/> BIOL 4400 (QI) Plant Physiology (F)	4
<input type="checkbox"/> ECON 1500 (BAI) Introduction to Economic Institutions, History, and Principles (F,Sp)	3
<input type="checkbox"/> MATH 1050 (QL) College Algebra (F,Sp,Su)	4
<input type="checkbox"/> PHYS 1100 (BPS) Great Ideas in Physics	3
<input type="checkbox"/> PSC 1050 Plants, Soils, and Climate Orientation (F)	1
<input type="checkbox"/> PSC 3890 (CI) Preparation for Careers in Plants, Soils, and/or Climate (F)	1
<input type="checkbox"/> PSC 4890 (CI) Senior Seminar (Sp)	1
<input type="checkbox"/> SOIL 3000 Fundamentals of Soil Science (F)	4

In addition to the courses listed above, students must complete the course requirements for *either* Emphasis A (Agronomy) *or* B (Research/Biotechnology).

A. Agronomy Emphasis (56 credits)

Students must complete *all* of the following courses for the Agronomy Emphasis (9 credits).

	Credits
<input type="checkbox"/> CHEM 1110 (BPS) General Chemistry I (F,Sp)	4
<input type="checkbox"/> CHEM 1115 General Chemistry Laboratory (F,Sp)	1
(formerly CHEM 1130)	
<input type="checkbox"/> CHEM 1120 (BPS) General Chemistry II (Sp)	4

Additional Crop-related Courses:

Students must complete at least 36 credits chosen from the following crop-related courses, including all courses identified with an asterisk (*):

	Credits
<input type="checkbox"/> BIOL 3060 (QI) Principles of Genetics (F,Sp,Su)	4
(formerly BIOL 3200)	
<input type="checkbox"/> BIOL 4410 Plant Structure (Sp)	3
<input type="checkbox"/> BIOL 4430* Introduction to Plant Pathology (Sp)	4
<input type="checkbox"/> BIOL 4500* Applied Entomology (Sp)	3
<input type="checkbox"/> PLSC 2650 Identification and Selection of Plants in Production Agriculture (F)	1
<input type="checkbox"/> PLSC 3500 The Structure and Function of Economic Crop Plants (Sp)	3
<input type="checkbox"/> PLSC 3700 Plant Propagation (F)	4
<input type="checkbox"/> PLSC 3800 Turfgrass Management (F)	3
<input type="checkbox"/> PLSC 4280 Field Crops (F)	3
<input type="checkbox"/> PLSC 4320 Forage Production and Pasture Ecology (F)	3
<input type="checkbox"/> PLSC 4600 (QI) Cereal Science (Sp even)	3
<input type="checkbox"/> PLSC 5200 Environmental Plant Physiology (Sp)	2
<input type="checkbox"/> PLSC 5210 Environmental Plant Physiology Laboratory (Sp)	1
<input type="checkbox"/> PLSC 5550* Weed Biology and Control (F)	4
<input type="checkbox"/> PLSC 5700 Principles of Plant Breeding (Sp odd)	3
<input type="checkbox"/> PLSC 5750 Crop Biotechnology (Sp odd)	2
<input type="checkbox"/> PSC 4250 Internship in Plants, Soils, and/or Climate (F,Sp,Su)	1-4
<input type="checkbox"/> PSC 5200 Site-Specific Agriculture and Landscape/Horticultural Management (Sp, half semester)	3

Additional Soils-related Courses:

Students must complete at least 11 credits chosen from the following soils-related courses:

<input type="checkbox"/> SOIL 4000 Soil and Water Conservation (F)	4
<input type="checkbox"/> SOIL 4500 Soil Reclamation (Sp)	3
<input type="checkbox"/> SOIL 4700 Irrigated Soils (Sp, half semester)	3
<input type="checkbox"/> SOIL 5050 Principles of Environmental Soil Chemistry (Sp odd)	3
<input type="checkbox"/> SOIL 5130 Soil Genesis, Morphology, and Classification (F)	4
<input type="checkbox"/> SOIL 5310 Soil Microbiology (F even)	3
<input type="checkbox"/> SOIL 5320 Soil Microbiology Laboratory (F even)	2
<input type="checkbox"/> SOIL 5550 (QI) Soils and Plant Nutrient Bioavailability (Sp)	3
<input type="checkbox"/> SOIL 5560 Analytical Techniques for the Soil Environment (Sp)	2
<input type="checkbox"/> SOIL 5650 Environmental Soil Physics (F)	3

B. Research/Biotechnology Emphasis (56 credits)

Students must complete *all* of the following courses for the Research/Biotechnology Emphasis (38 credits).

	Credits
<input type="checkbox"/> BIOL 3060 (QI) Principles of Genetics (F,Sp,Su)	4
(formerly BIOL 3200)	
<input type="checkbox"/> CHEM 1210 Principles of Chemistry I (F,Sp)	4
<input type="checkbox"/> CHEM 1215 Chemical Principles Laboratory I (F,Sp)	1
(formerly CHEM 1230)	
<input type="checkbox"/> CHEM 1220 (BPS) Principles of Chemistry II (F,Sp,Su)	4
<input type="checkbox"/> CHEM 1225 Chemical Principles Laboratory II (F,Sp)	1
(formerly CHEM 1240)	
<input type="checkbox"/> CHEM 2310 Organic Chemistry I (F)	4
<input type="checkbox"/> CHEM 2315 Organic Chemistry Laboratory I (F)	1
(formerly CHEM 2330)	
<input type="checkbox"/> CHEM 2320 Organic Chemistry II (Sp)	4
<input type="checkbox"/> CHEM 2325 Organic Chemistry Laboratory II (Sp, blocks 1 & 2)	1
(formerly CHEM 2340)	
<input type="checkbox"/> CHEM 3700 Introductory Biochemistry (Sp)	3
<input type="checkbox"/> CHEM 3710 Introductory Biochemistry Laboratory (Sp)	1
<input type="checkbox"/> MATH 1060 Trigonometry (F,Sp,Su)	2
<input type="checkbox"/> PLSC 5200 Environmental Plant Physiology (Sp)	2
<input type="checkbox"/> PLSC 5210 Environmental Plant Physiology Laboratory (Sp)	1
<input type="checkbox"/> PLSC 5750 Crop Biotechnology (Sp odd)	2
<input type="checkbox"/> SOIL 5550 (QI) Soils and Plant Nutrient Bioavailability (Sp)	3

Additional Crop-related Courses:

Students must complete at least 18 credits chosen from the following crop-related courses:

	Credits
<input type="checkbox"/> PLSC 2650 Identification and Selection of Plants in Production Agriculture (F)	1
<input type="checkbox"/> PLSC 3700 Plant Propagation (F)	4
<input type="checkbox"/> PLSC 4280 Field Crops (F)	3
<input type="checkbox"/> PLSC 4300 World Food Crops and Cropping Systems: The Plants That Feed Us (F even)	3
<input type="checkbox"/> PLSC 4320 Forage Production and Pasture Ecology (F)	3
<input type="checkbox"/> PLSC 4600 (QI) Cereal Science (Sp even)	3
<input type="checkbox"/> PLSC 5430 Plant Nutrition (F odd)	2
<input type="checkbox"/> PLSC 5440 Plant Molecular, Cellular, and Developmental Biology I (Sp even)	3
<input type="checkbox"/> PLSC 5450 Plant Molecular, Cellular, and Developmental Biology II (Sp odd)	3
<input type="checkbox"/> PLSC 5550 Weed Biology and Control (F)	4
<input type="checkbox"/> PLSC 5600 Plant Water Relations (F)	2
<input type="checkbox"/> PLSC 5700 Principles of Plant Breeding (Sp odd)	3
<input type="checkbox"/> PSC 5160 Methods in Biotechnology: Cell Culture (Sp)	3
<input type="checkbox"/> PSC 5240 Methods in Biotechnology: Protein Purification Techniques (Sp)	3
<input type="checkbox"/> PSC 5260 Methods in Biotechnology: Molecular Cloning (F)	3
<input type="checkbox"/> SOIL 5560 Analytical Techniques for the Soil Environment (Sp)	2
<input type="checkbox"/> STAT 2000 (QI) Statistical Methods (F,Sp) (3 cr) or	
<input type="checkbox"/> STAT 3000 (QI) Statistics for Scientists (F,Sp,Su) (3 cr)	3

The following courses are also recommended:

<input type="checkbox"/> BIOL 4410 Plant Structure (Sp)	3
<input type="checkbox"/> BIOL 4430 Introduction to Plant Pathology (Sp)	4
<input type="checkbox"/> BIOL 4500 Applied Entomology (Sp)	3
<input type="checkbox"/> BIOL 5210 Cell Biology (F)	3
<input type="checkbox"/> BIOL 5230 Developmental Biology (Sp)	3
<input type="checkbox"/> MATH 1210 (QL) Calculus I (F,Sp,Su)	4
<input type="checkbox"/> PHYS 2110 The Physics of Living Systems I	4
<input type="checkbox"/> PLSC 5440 Plant Molecular, Cellular, and Developmental Biology I (Sp even)	3
<input type="checkbox"/> PLSC 5450 Plant Molecular, Cellular, and Developmental Biology II (Sp odd)	3

ARCPACS Requirements

Certified Professional Agronomist (84 credits) Certified Professional Crop Scientist (84 credits)

Students wishing to obtain ARCPACS certification must satisfy the requirements for the Bachelor of Science degree, as well as complete any additional courses.

For general information, students should refer to the American Society of Agronomy website at: <https://www.agronomy.org/> or the ARCPACS website at: <https://www.agronomy.org/certifications/>

For **Certified Agronomist**, take 9 credits chosen from the following courses. For **Certified Crop Scientist**, take 15 credits chosen from the following courses.

Credits

<input type="checkbox"/> PLSC 3800 Turfgrass Management (F)	3
<input type="checkbox"/> PLSC 4280 Field Crops (F)	3
<input type="checkbox"/> PLSC 4320 Forage Production and Pasture Ecology (F)	3
<input type="checkbox"/> PLSC 4600 (QI) Cereal Science (Sp even)	3
<input type="checkbox"/> PLSC 5200 Environmental Plant Physiology (Sp)	2
<input type="checkbox"/> PLSC 5210 Environmental Plant Physiology Laboratory (Sp)	1
<input type="checkbox"/> PLSC 5700 Principles of Plant Breeding (Sp odd)	3

Both ARCPACS categories (Agronomy and Crop Science) require the following course:

<input type="checkbox"/> SOIL 5550 (QI) Soils and Plant Nutrient Bioavailability (Sp)	3
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For **Certified Agronomist**, take at least 6 credits from the following list:

<input type="checkbox"/> SOIL 4000 Soil and Water Conservation (F)	4
<input type="checkbox"/> SOIL 4700 Irrigated Soils (Sp, half semester)	3
<input type="checkbox"/> SOIL 5050 Principles of Environmental Soil Chemistry (Sp odd)	3
<input type="checkbox"/> SOIL 5130 Soil Genesis, Morphology, and Classification (F)	4

For **Certified Agronomist** or **Certified Crop Scientist**, take at least two of the following three courses:

<input type="checkbox"/> BIOL 4430 Introduction to Plant Pathology (Sp)	4
<input type="checkbox"/> BIOL 4500 Applied Entomology (Sp)	3
<input type="checkbox"/> PLSC 5550 Weed Biology and Control (F)	4

For **Certified Agronomist** or **Certified Crop Scientist**, take *all* of these courses:

<input type="checkbox"/> ASTE 3050 (CI) Technical and Professional Communication Principles in Agriculture (F,Sp)	3
<input type="checkbox"/> SPCH 1020 (CI) Public Speaking (F,Sp) (formerly SPCH 1050)	3
<input type="checkbox"/> CS 1030 (BPS) Foundations of Computer Science (F) (formerly CS 1010)	3
<input type="checkbox"/> ECON 2010 (BSS) Introduction to Microeconomics (F,Sp,Su)	3
<input type="checkbox"/> STAT 1040 (QL) Introduction to Statistics (F,Sp,Su)	3
<input type="checkbox"/> CHEM 3650 Environmental Chemistry (Sp)	3

Requirement Changes

Graduation requirements shown on this sheet are subject to change. Students should check with the departmental advisor concerning possible changes.

Materials for Persons with Disabilities

This requirement sheet is available in digital format, recordings, or large print upon request to the USU Disability Resource Center.

For information contact

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