

# Department of Plants, Soils, and Climate

**Department Head:** Teryl R. Roper  
**Location:** Agricultural Science 322C  
**Phone:** (435) 797-2233  
**FAX:** (435) 797-3376  
**E-mail:** teryl.roper@usu.edu  
**WWW:** <http://psc.usu.edu/>

## Undergraduate Advisor:

M. Cathryn Myers-Roche, Agricultural Science 322, (435) 797-5560,  
[cmyers@mendel.usu.edu](mailto:cmyers@mendel.usu.edu)

## Undergraduate Off-Campus Advisor:

Donna B. Minch, Farmington, (801) 451-4604,  
[donna.minch@usu.edu](mailto:donna.minch@usu.edu)

## Graduate Program Coordinator:

Paul G. Johnson, Agricultural Science 306, (435) 797-7039,  
[paul.johnson@usu.edu](mailto:paul.johnson@usu.edu)

**Degrees Offered:** Bachelor of Science (BS) and Bachelor of Arts (BA) in Crop Science, Horticulture, Environmental Soil/Water Science; BS in Residential Landscape Design and Construction; Master of Science (MS), and Doctor of Philosophy (PhD) in Biometeorology, Plant Science, Soil Science, and Ecology; Master of Professional Studies in Horticulture (MPSH)

**Undergraduate emphases:** *Crop Science BS, BA*—Agronomy, Research/Biotechnology; *Horticulture BS, BA*—Ornamental Horticulture, Landscape Maintenance and Construction, Turfgrass Management, Business, Science; *Environmental Soil/Water Science BS, BA*—Soil, Water, Plant

**Graduate specializations:** *Biometeorology MS, PhD*—Agricultural Meteorology, Climatology, Micrometeorology, Remote Sensing, Turbulence in Plant Canopies; *Plant Science MS, PhD*—Crop Physiology, Crop Production and Management, Molecular Biology, Plant Breeding and Cytology, Plant Biotechnology and Tissue Culture, Plant Nutrition, Space Biology, Weed Science; *Soil Science MS, PhD*—Molecular Biology, Soil and Water Chemistry, Soil Biochemistry and Ecology, Soil Conservation Systems, Soil Fertility and Plant Nutrition, Soil Physics, Soil-Plant-Water Relations, Soil Taxonomy and Genesis, Soils and Irrigation; *Master of Professional Studies in Horticulture (MPSH)*—Water Efficient Landscaping

**Certificate and Associate Degree Program:** Ornamental Horticulture

## Undergraduate Programs

### Objectives

The departmental curricula emphasize understanding the physical, chemical, and biological mechanisms that operate in the continuum of the soil, plants, and the atmosphere; and how they impact management of a wide range of agricultural and natural systems.

The undergraduate teaching program facilitates the acquisition and application of knowledge, understanding, and skills by students within their chosen field of study. The program also prepares students to develop lifelong learning skills, understand and appreciate diversity, be productive citizens of the world, and be professionals in their vocations.

The department also provides training of undergraduates for graduate school and maintains a strong graduate program in biometeorology, plant science, and soil science. The research that underlies the

graduate program is conducted in biometeorology (micro- and meso-scale), crop biotechnology, crop ecology, crop physiology, crop science, horticulture (general and ornamental), plant breeding, soil microbiology, pedology, soil chemistry, soil physics, soil fertility, environmental soil and water science, and arid landscaping.

A major effort is directed at extending research and teaching programs to all citizens of the State of Utah.

## Departmental Facilities

To support these objectives, departmental facilities include well-equipped laboratories and greenhouses on campus. The University has significant acreage for field research at strategic locations throughout the state. In addition, the University is developing a botanical garden, which will offer opportunities to a broad spectra of clientele. The department maintains state-of-the-art analytical equipment for the measurement of critical soil, plant, and climatic variables.

## Requirements

### Departmental Admission Requirements

Persons meeting the admission requirements for the University (see pages 16-20) are admitted to the Department of Plants, Soils, and Climate by listing the department major code on the University admission application form. A change of major form is used when students in good standing wish to transfer from another department to the Department of Plants, Soils, and Climate.

### ARCPACS Certification

Students who meet specific requirements are eligible, after five years of work experience, for professional certification as an Agronomist, Crop Scientist, Crop Specialist, Horticulturist, Soil Scientist, Soil Specialist, or Soil Classifier through the American Registry of Certified Professionals in Agronomy, Crops, and Soils (ARCPACS). General information about ARCPACS certifications can be found at <https://www.agronomy.org/certifications/>. Students interested in becoming certified should inform their advisor of their intent. This certification is granted *in addition* to the bachelor's degree.

### Applied Ornamental Horticulture Certificates and AAS Degree

This program provides practical training in greenhouse and nursery management, turf production, and landscape management. Coursework encompasses pest control, plant identification, construction of landscapes, small business management, and the operation and maintenance of equipment, including small engines. As an integral part of their training, students are required to complete an internship in the industry. Students may work toward a **one-year certificate** or an **Associate of Applied Science Degree**.

### Bachelor of Science Degree

The department offers the Bachelor of Science Degree in three areas: (1) **Crop Science**, which deals with agronomic (commonly called field) crops, such as forages, grains, corn, pasture, etc.; (2) **Horticulture**, which deals with tree fruits, berries, vine fruits, vegetables, and ornamental plants (**ornamental** includes all aspects of floriculture and landscape plant production and use); and (3) **Environmental Soil/Water Science**, which deals with soil and water in relation to plant growth and environmental quality. In all three majors, there are science-oriented emphases intended to prepare students for research or professional studies, and degree emphases that emphasize a practical, applied approach to application of information. All courses

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used to fill major requirements must be taken on an *A-B-C-D-F* basis. A minimum 2.5 GPA is required for courses used for the major. Transfer students are required to take at least 18 credits of major subject courses in residence at USU. A minor may be earned in Agronomy, Crop Biotechnology, Horticulture, Ornamental Horticulture, and Soil Science. A minimum of 16 approved credits are required (see lists below). All courses must be taken on an *A-B-C-D-F* basis and passed with a grade of *C-* or better. For information about receiving a Bachelor of Arts degree, consult the departmental undergraduate advisor.

The course requirements for the **Crop Science Major** are designed to prepare students for a career related to the production of agronomic crops. These courses allow students to function well in a rapidly changing technological environment and to acquire new skills and understanding as their career evolves. Each of the emphases within this major has been designed to allow students the flexibility to add courses or a minor to meet their own goals. The **Agronomy Emphasis** is designed for students interested in learning more about the applied aspects of crop production. Some courses emphasize production techniques and systems, while others provide the student with an understanding of the 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.

The **Horticulture Major** prepares students for production of fruits, vegetables, turf, or ornamentals and for landscape construction and maintenance. Course topics include biology, chemistry, and control of insects, diseases, and weeds. The **Ornamental Horticulture Emphasis** adds courses in production management techniques, such as pruning, spraying, and landscaping (materials, design, and maintenance); and greenhouse management. In the **Landscape Maintenance and Construction Emphasis**, students learn design, construction, and maintenance through a joint program with the Landscape Architecture and Environmental Planning Department. In the **Turfgrass Management Emphasis**, students complete courses in turfgrass management to prepare them for careers in golf course, park, athletic field, and landscaping management. The **Science Emphasis** prepares students for graduate study and for employment in technical occupations. The **Business Emphasis** joins courses necessary for a minor in Business with those necessary for obtaining expertise in horticulture.

The **Environmental Soil/Water Science Major** is intended to provide each student with a fundamental understanding of the basic sciences and mathematics, as well as a strong background in both soil and water sciences. Preparatory requirements include chemistry, physics, mathematics, biology, geology, and statistics. The core courses for Environmental Soil/Water Science emphasize the interactive soil/water processes in the soil's plant-rooting zone—from the microscopic to the landscape perspective. From this base, each student can design his or her own program of specialization in one of the many aspects of soil science, water science, or the integration of both soil and water sciences. Students may choose complementary classes in the **Soil Emphasis**, **Water Emphasis**, or **Plant Emphasis** in preparation for a variety of career opportunities. The Environmental Soil/Water Science Major is complementary to existing undergraduate programs at Utah State University in Geology, Environmental Studies, Watershed and Earth Systems, and Environmental Engineering.

## Course Requirements

### Crop Science Major

#### Crop Science Major Core Courses (29 credits)

All Crop Science majors must complete the following courses:

|  |   |
|--|---|
| <b>BIOL 1610</b> Biology I (F).....  | 4 |
| <b>BIOL 1620 (BLS)</b> Biology II (Sp).....  | 4 |
| <b>BIOL 4400 (QI)</b> Plant Physiology (F).....  | 4 |
| <b>ECON 1500 (BAI)</b> Introduction to Economic Institutions, History, and Principles (F,Sp,Su)..... | 3 |
| <b>MATH 1050 (QL)</b> College Algebra (F,Sp,Su).....   | 4 |
| <b>PHYS 1100 (BPS)</b> Great Ideas in Physics.....   | 3 |
| <b>PSC 1050</b> Plants, Soils, and Climate Orientation (F).....                                      | 1 |
| <b>PSC 3890 (CI)</b> Preparation for Careers in Plants, Soils, and/or Climate (F).....               | 1 |
| <b>PSC 4890 (CI)</b> Senior Seminar (Sp).....  | 1 |
| <b>SOIL 3000</b> 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).

|   |   |
|---|---|
| <b>CHEM 1110 (BPS)</b> General Chemistry I (F,Sp).....    | 4 |
| <b>CHEM 1115</b> General Chemistry Laboratory (F,Sp)..... | 1 |
| <b>CHEM 1120 (BPS)</b> 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 (\*):

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

|   |   |
|---|---|
| <b>SOIL 4000</b> Soil and Water Conservation (F).....                     | 4 |
| <b>SOIL 4500</b> Soil Reclamation (Sp).....                               | 3 |
| <b>SOIL 4700</b> Irrigated Soils (Sp, half semester).....                 | 3 |
| <b>SOIL 5050</b> Principles of Environmental Soil Chemistry (Sp odd)..... | 3 |
| <b>SOIL 5130</b> Soil Genesis, Morphology, and Classification (F).....    | 4 |
| <b>SOIL 5310</b> Soil Microbiology (F even).....                          | 3 |
| <b>SOIL 5320</b> Soil Microbiology Laboratory (F even).....               | 2 |

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|  |   |
|--|---|
| SOIL 5550 (QI) Soils and Plant Nutrient Bioavailability (Sp).....  | 3 |
| SOIL 5560 Analytical Techniques for the Soil Environment (Sp)..... | 2 |
| 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).

|   |   |
|---|---|
| BIOL 3060 (QI) Principles of Genetics (F,Sp,Su).....              | 4 |
| CHEM 1210 Principles of Chemistry I (F,Sp).....                   | 4 |
| CHEM 1215 Chemical Principles Laboratory I (F,Sp).....            | 1 |
| CHEM 1220 (BPS) Principles of Chemistry II (F,Sp,Su).....         | 4 |
| CHEM 1225 Chemical Principles Laboratory II (F,Sp).....           | 1 |
| CHEM 2310 Organic Chemistry I (F).....                            | 4 |
| CHEM 2315 Organic Chemistry Laboratory I (F).....                 | 1 |
| CHEM 2320 Organic Chemistry II (Sp).....                          | 4 |
| CHEM 2325 Organic Chemistry Laboratory II (Sp, blocks 1 & 2)..... | 1 |
| CHEM 3700 Introductory Biochemistry (Sp).....                     | 3 |
| CHEM 3710 Introductory Biochemistry Laboratory (Sp).....          | 3 |
| MATH 1060 Trigonometry (F,Sp,Su).....                             | 2 |
| PLSC 5200 Environmental Plant Physiology (Sp).....                | 2 |
| PLSC 5210 Environmental Plant Physiology Laboratory (Sp).....     | 1 |
| PLSC 5750 Crop Biotechnology (Sp odd).....                        | 2 |
| 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:

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

The following courses are also recommended:

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

## Sample Curriculum for Crop Science

### Major—Agronomy Emphasis

The sample curriculum shows most lower-division courses selected freshman and sophomore years, and most upper-division courses selected junior and senior years.

### Freshman Year (30 credits)

#### Fall Semester (15 credits)

|   |   |
|---|---|
| BIOL 1610 <sup>1</sup> Biology I.....                             | 4 |
| MATH 1050 (QL) <sup>1</sup> College Algebra.....                  | 4 |
| PSC 1050 <sup>1</sup> Plants, Soils, and Climate Orientation..... | 1 |
| CHEM 1110 (BPS) <sup>2</sup> General Chemistry I.....             | 4 |
| Elective course(s) <sup>6</sup> .....                             | 2 |

#### Spring Semester (15 credits)

|   |   |
|---|---|
| BIOL 1620 (BLS) <sup>1</sup> Biology II.....  | 4 |
| CHEM 1115 <sup>2</sup> General Chemistry Laboratory.....  | 1 |
| CHEM 1120 (BPS) <sup>2</sup> General Chemistry II.....  | 4 |
| ECON 1500 (BAI) <sup>1</sup> Introduction to Economic Institutions, History, and<br>Principles..... | 3 |
| PSC 2040 <sup>6</sup> Introduction to Biotechnology.....  | 1 |
| Elective course(s) <sup>6</sup> .....   | 2 |

### Sophomore Year (28 credits)

#### Fall Semester (16 credits)

|  |   |
|--|---|
| PLSC 4280 <sup>3</sup> Field Crops.....  | 3 |
| PLSC 4320 <sup>3</sup> Forage Production and Pasture Ecology.....                                | 3 |
| USU 1320 (BHU) Civilization: Humanities.....   | 3 |
| USU 1330 (BCA) Civilization: Creative Arts.....  | 3 |
| ENGL 2010 (CL2) <sup>5</sup> Intermediate Writing: Research Writing in a<br>Persuasive Mode..... | 3 |
| PLSC 2650 <sup>3</sup> Identification and Selection of Plants in Production<br>Agriculture.....  | 1 |

#### Spring Semester (12 credits)

|  |   |
|--|---|
| PLSC 3500 <sup>3</sup> The Structure and Function of Economic Crop Plants..... | 3 |
| PHYS 1100 (BPS) Great Ideas in Physics.....                                    | 3 |
| MIS 2100 Principles of Management Information<br>Systems.....                  | 3 |
| BIOL 4500 <sup>7</sup> Applied Entomology.....                                 | 3 |

### Junior Year (31 credits)

#### Fall Semester (15 credits)

|  |   |
|--|---|
| BIOL 3060 (QI) <sup>3</sup> Principles of Genetics.....  | 4 |
| SOIL 3000 <sup>1</sup> Fundamentals of Soil Science..... | 4 |
| HIST 3850 (DHA/CI) <sup>5</sup> History of Utah.....     | 3 |
| Elective course(s) <sup>6</sup> .....                    | 4 |

#### Spring Semester (16 credits)

|  |   |
|--|---|
| BIOL 4430 <sup>7</sup> Introduction to Plant Pathology.....                              | 4 |
| PLSC 4600 (QI) <sup>3</sup> Cereal Science (taught even years <i>only</i> ).....         | 3 |
| PLSC 5700 <sup>3</sup> Principles of Plant Breeding (taught odd years <i>only</i> )..... | 3 |
| SOIL 4700 <sup>4</sup> Irrigated Soils (half semester).....                              | 3 |
| STAT 3000 (QI) <sup>6</sup> Statistics for Scientists.....                               | 3 |

### Senior Year (31 credits)

#### Fall Semester (15 credits)

|   |   |
|---|---|
| BIOL 4400 (QI) <sup>1</sup> Plant Physiology.....   | 4 |
| PLSC 5550 <sup>7</sup> Weed Biology and Control.....  | 4 |
| PSC 3890 (CI) <sup>1</sup> Preparation for Careers in Plants, Soils,<br>and/or Climate..... | 1 |
| PSC 4250 <sup>3</sup> Internship in Plants, Soils, and/or Climate.....                      | 2 |
| SOIL 4000 <sup>4</sup> Soil and Water Conservation.....                                     | 4 |

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## Spring Semester (16 credits)

|   |   |
|---|---|
| BIOL 4410 <sup>3</sup> Plant Structure .....                                | 3 |
| PLSC 5200 <sup>3</sup> Environmental Plant Physiology .....                 | 2 |
| PLSC 5210 <sup>3</sup> Environmental Plant Physiology Laboratory .....      | 1 |
| PSC 4890 (CI) <sup>1</sup> Senior Seminar .....                             | 1 |
| SOIL 5550 (QI) <sup>4</sup> Soils and Plant Nutrient Bioavailability .....  | 3 |
| SOIL 5560 <sup>4</sup> Analytical Techniques for the Soil Environment ..... | 2 |
| Elective course(s) <sup>6</sup> .....                                       | 4 |

## Sample Curriculum for Crop Science Major— Research/Biotechnology Emphasis

The sample curriculum shows most lower-division courses selected freshman and sophomore years, and most upper-division courses selected junior and senior years.

## Freshman Year (28 credits)

### Fall Semester (15 credits)

|  |   |
|--|---|
| BIOL 1610 <sup>1</sup> Biology I .....                             | 4 |
| MATH 1050 (QL) <sup>1</sup> College Algebra .....                  | 4 |
| PSC 1050 <sup>1</sup> Plants, Soils, and Climate Orientation ..... | 1 |
| CHEM 1210 <sup>8</sup> Principles of Chemistry I .....             | 4 |
| CHEM 1215 <sup>8</sup> Chemical Principles Laboratory I .....      | 1 |
| Elective course <sup>11</sup> .....                                | 1 |

### Spring Semester (13 credits)

|   |   |
|---|---|
| BIOL 1620 (BLS) <sup>1</sup> Biology II .....   | 4 |
| CHEM 1220 (BPS) <sup>8</sup> Principles of Chemistry II .....                                     | 4 |
| CHEM 1225 <sup>8</sup> Chemical Principles Laboratory II .....                                    | 1 |
| ECON 1500 (BAI) <sup>1</sup> Introduction to Economic Institutions, History, and Principles ..... | 3 |
| PSC 2040 <sup>11</sup> Introduction to Biotechnology .....  | 1 |

## Sophomore Year (30 credits)

### Fall Semester (15 credits)

|  |   |
|--|---|
| CHEM 2310 <sup>8</sup> Organic Chemistry I .....   | 4 |
| CHEM 2315 <sup>8</sup> Organic Chemistry Laboratory I .....                                    | 1 |
| USU 1320 (BHU) Civilization: Humanities .....  | 3 |
| USU 1330 (BCA) Civilization: Creative Arts .....   | 3 |
| ENGL 2010 (CL2) <sup>5</sup> Intermediate Writing: Research Writing in a Persuasive Mode ..... | 3 |
| PLSC 2650 <sup>9</sup> Identification and Selection of Plants in Production Agriculture .....  | 1 |

### Spring Semester (15 credits)

|   |   |
|---|---|
| CHEM 2320 <sup>8</sup> Organic Chemistry II .....                           | 4 |
| CHEM 2325 <sup>8</sup> Organic Chemistry Laboratory II (blocks 1 & 2) ..... | 1 |
| PHYS 1100 (BPS) <sup>1</sup> Great Ideas in Physics .....                   | 3 |
| BUS 3100 (DSS) <sup>5</sup> Survey of Management Information Systems .....  | 3 |
| MATH 1210 (QL) <sup>10</sup> Calculus I .....                               | 4 |

## Junior Year (28 credits)

### Fall Semester (15 credits)

|   |   |
|---|---|
| BIOL 3060 (QI) <sup>8</sup> Principles of Genetics .....  | 4 |
| SOIL 3000 <sup>1</sup> Fundamentals of Soil Science ..... | 4 |
| PLSC 3700 <sup>9</sup> Plant Propagation .....            | 4 |
| Elective course(s) <sup>11</sup> .....                    | 3 |

### Spring Semester (13 credits)

|   |   |
|---|---|
| CHEM 3700 <sup>8</sup> Introductory Biochemistry .....                            | 3 |
| CHEM 3710 <sup>8</sup> Introductory Biochemistry Laboratory .....                 | 1 |
| HIST 3850 (DHA/CI) <sup>5</sup> History of Utah .....                             | 3 |
| PLSC 4600 (QI) <sup>9</sup> Cereal Science (taught even years <i>only</i> ) ..... | 3 |
| STAT 3000 (QI) <sup>11</sup> Statistics for Scientists .....                      | 3 |

## Senior Year (32 credits)

### Fall Semester (15 credits)

|   |   |
|---|---|
| BIOL 4400 (QI) <sup>1</sup> Plant Physiology .....  | 4 |
| BIOL 5210 <sup>10</sup> Cell Biology .....  | 3 |
| PLSC 5550 <sup>9</sup> Weed Biology and Control .....                                     | 4 |
| PSC 3890 (CI) <sup>1</sup> Preparation for Careers in Plants, Soils, and/or Climate ..... | 1 |
| Elective course(s) <sup>11</sup> .....  | 3 |

### Spring Semester (17 credits)

|   |   |
|---|---|
| BIOL 5230 <sup>10</sup> Developmental Biology .....                             | 3 |
| PLSC 5200 <sup>8</sup> Environmental Plant Physiology .....                     | 2 |
| PLSC 5210 <sup>8</sup> Environmental Plant Physiology Laboratory .....          | 1 |
| PLSC 5750 <sup>8</sup> Crop Biotechnology (taught odd years <i>only</i> ) ..... | 2 |
| PSC 4890 (CI) <sup>1</sup> Senior Seminar .....                                 | 1 |
| SOIL 5550 (QI) <sup>8</sup> Soils and Plant Nutrient Bioavailability .....      | 3 |
| Elective course(s) <sup>11</sup> .....  | 5 |

<sup>1</sup>This course is required as part of the Crop Science Major Core.

<sup>2</sup>This course is required for the Agronomy Emphasis.

<sup>3</sup>This course is included in the Additional Crop-related Courses for the Agronomy Emphasis.

<sup>4</sup>This course is included in the Additional Soils-related Courses for the Agronomy Emphasis.

<sup>5</sup>This course is a restricted elective. Other courses may be used to satisfy this requirement.

<sup>6</sup>This course is an unrestricted elective.

<sup>7</sup>Students must complete at least 9 credits selected from these Agronomy Emphasis courses.

<sup>8</sup>This course is required for the Research/Biotechnology Emphasis.

<sup>9</sup>This course is included in the Additional Crop-related Courses for the Research/Biotechnology Emphasis.

<sup>10</sup>This course is a recommended elective for the Research/Biotechnology Emphasis.

<sup>11</sup>This course is an unrestricted elective. Some suggested courses are indicated.

## ARCPACS Certification

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

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

|  |   |
|--|---|
| PLSC 3800 Turfgrass Management (F) .....                       | 3 |
| PLSC 4280 Field Crops (F) .....                                | 3 |
| PLSC 4320 Forage Production and Pasture Ecology (F) .....      | 3 |
| PLSC 4600 (QI) Cereal Science (Sp even) .....                  | 3 |
| PLSC 5200 Environmental Plant Physiology (Sp) .....            | 2 |
| PLSC 5210 Environmental Plant Physiology Laboratory (Sp) ..... | 1 |
| PLSC 5700 Principles of Plant Breeding (Sp odd) .....          | 3 |

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

|  |   |
|--|---|
| SOIL 5550 (QI) Soils and Plant Nutrient Bioavailability (Sp) ..... | 3 |
|--|---|

For **Certified Agronomist**, take at least 6 credits from the following list:

|   |   |
|---|---|
| SOIL 4000 Soil and Water Conservation (F) .....                     | 4 |
| SOIL 4700 Irrigated Soils (Sp, half semester) .....                 | 3 |
| SOIL 5050 Principles of Environmental Soil Chemistry (Sp odd) ..... | 3 |
| SOIL 5130 Soil Genesis, Morphology, and Classification (F) .....    | 4 |

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

|   |   |
|---|---|
| <b>BIOL 4430</b> Introduction to Plant Pathology (Sp) ..... | 4 |
| <b>BIOL 4500</b> Applied Entomology (Sp) .....              | 3 |
| <b>PLSC 5550</b> Weed Biology and Control (F).....          | 4 |

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

|   |   |
|---|---|
| <b>ASTE 3050 (CI)</b> Technical and Professional Communication Principles in Agriculture (F,Sp) ..... | 3 |
| <b>SPCH 1020 (CI)</b> Public Speaking (F,Sp) .....  | 3 |
| <b>CS 1030 (BPS)</b> Foundations of Computer Science (F).....   | 3 |
| <b>ECON 2010 (BSS)</b> Introduction to Microeconomics (F,Sp).....                                     | 3 |
| <b>STAT 1040 (QL)</b> Introduction to Statistics (F,Sp,Su) .....                                      | 3 |
| <b>CHEM 3650</b> Environmental Chemistry (Sp).....  | 3 |

## Horticulture Major

Students must complete the core courses and courses for one of the four emphases to fulfill the requirements for a Horticulture Degree.

### Core Courses (23-26 credits)

|   |     |
|---|-----|
| <b>CHEM 1110 (BPS)</b> General Chemistry I (F,Sp) (4 cr) or                                 |     |
| <b>CHEM 1210</b> Principles of Chemistry I (F,Sp) (4 cr) .....                              | 4   |
| <b>MATH 1050 (QL)</b> College Algebra (F,Sp,Su).....  | 4   |
| <b>OSS 1400</b> Microcomputer Applications .....  | 3   |
| <b>PLSC 2250</b> Occupational Experience in Agronomy and Horticulture (F,Sp,Su) (1-4 cr) or |     |
| <b>PSC 4250</b> Internship in Plants, Soils, and/or Climate (F,Sp,Su) (1-4 cr).....         | 1-4 |
| <b>PLSC 2650</b> Identification and Selection of Plants in Production Agriculture (F).....  | 1   |
| <b>PSC 1050</b> Plants, Soils, and Climate Orientation (F).....                             | 1   |
| <b>PSC 3890 (CI)</b> Preparation for Careers in Plants, Soils, and/or Climate (F) .....     | 1   |
| <b>PSC 4890 (CI)</b> Senior Seminar (Sp).....   | 1   |
| <b>SOIL 3000</b> Fundamentals of Soil Science (F).....                                      | 4   |
| <b>WILD 2200 (BLS)</b> Ecology of Our Changing World (F,Sp).....                            | 3   |

### A. Ornamental Horticulture Emphasis (49 credits minimum)

In addition to the Core Courses, select 40 credits from the following courses. Those marked with an asterisk (\*) are required.

|   |     |
|---|-----|
| <b>ASTE 3080</b> Compact Power Units for Agricultural and Turfgrass Applications (Sp) ..... | 3   |
| <b>BIOL 1610*</b> Biology I (F) .....   | 4   |
| <b>BIOL 1620 (BLS)*</b> Biology II (Sp) .....   | 4   |
| <b>BIOL 3060 (QI)*</b> Principles of Genetics (F,Sp,Su).....                                | 4   |
| <b>PLSC 2100 (BLS)</b> Introduction to Horticulture (F).....                                | 3   |
| <b>PLSC 2600*</b> Annual and Perennial Plant Materials (F, half semester).....              | 1.5 |
| <b>PLSC 2620*</b> Woody Plant Materials: Trees and Shrubs for the Landscape (F) .....       | 3   |
| <b>PLSC 3050</b> Greenhouse Management and Crop Production (Sp) .....                       | 4   |
| <b>PLSC 3300</b> Residential Landscapes (Sp).....   | 3   |
| <b>PLSC 3400</b> Landscape Management Principles and Practices (Sp).....                    | 3   |
| <b>PLSC 3700</b> Plant Propagation (F).....   | 4   |
| <b>PLSC 3800</b> Turfgrass Management (F) .....   | 3   |
| <b>PLSC 4400*</b> Modern Vegetable Production (F).....                                      | 3   |
| <b>PLSC 4500*</b> Fruit Production (Sp even).....   | 3   |
| <b>PLSC 4800</b> Professional Turfgrass Management (Sp) .....                               | 2   |
| <b>PSC 2800</b> Fundamentals of Organic Agriculture (Sp).....                               | 3   |
| <b>SOIL 4500</b> Soil Reclamation (Sp) .....  | 3   |
| <b>SOIL 5550 (QI)*</b> Soils and Plant Nutrient Bioavailability (Sp) .....                  | 3   |

Select two of the following courses:

|   |   |
|---|---|
| <b>BIOL 4430</b> Introduction to Plant Pathology (Sp) ..... | 4 |
| <b>BIOL 4500</b> Applied Entomology (Sp) .....              | 3 |
| <b>PLSC 5550</b> Weed Biology and Control (F).....          | 4 |

Select two of the following courses:

|   |   |
|---|---|
| <b>BIOL 4400 (QI)</b> Plant Physiology (F).....                               | 4 |
| <b>BIOL 4410</b> Plant Structure (Sp) .....                                   | 3 |
| <b>CHEM 1120 (BPS)</b> General Chemistry II (Sp).....                         | 4 |
| <b>PLSC 3500</b> The Structure and Function of Economic Crop Plants (Sp)..... | 3 |
| <b>PLSC 5200</b> Environmental Plant Physiology (Sp).....                     | 2 |
| <b>PLSC 5210</b> Environmental Plant Physiology Laboratory (Sp) .....         | 1 |

### B. Landscape Maintenance and Construction Emphasis (47.5 credits)

In addition to the Core Courses, students must complete the following courses for the Landscape Maintenance and Construction Emphasis.

All courses are required.

|  |     |
|--|-----|
| <b>BIOL 1610</b> Biology I (F).....  | 4   |
| <b>LAEP 1200</b> Basic Graphics in Landscape Architecture (F).....                   | 4   |
| <b>LAEP 2600 (QI)</b> Landscape Construction I (F) .....                             | 4   |
| <b>LAEP 3500</b> Planting Design (F) .....   | 2   |
| <b>LAEP 3610</b> Landscape Construction II (Sp) .....                                | 4   |
| <b>PLSC 2200</b> Pest Management Principles and Practices (Sp).....                  | 3   |
| <b>PLSC 2600</b> Annual and Perennial Plant Materials (F, half semester).....        | 1.5 |
| <b>PLSC 2620</b> Woody Plant Materials: Trees and Shrubs for the Landscape (F) ..... | 3   |
| <b>PLSC 3300</b> Residential Landscapes (Sp).....                                    | 3   |
| <b>PLSC 3400</b> Landscape Management Principles and Practices (Sp).....             | 3   |
| <b>PLSC 3500</b> The Structure and Function of Economic Crop Plants (Sp).....        | 3   |
| <b>PLSC 3800</b> Turfgrass Management (F) .....                                      | 3   |
| <b>PLSC 4400</b> Modern Vegetable Production (F) (3 cr) or                           |     |
| <b>PLSC 4500</b> Fruit Production (Sp even) (3 cr).....                              | 3   |
| <b>PLSC 5550</b> Weed Biology and Control (F).....                                   | 4   |
| <b>SOIL 4700</b> Irrigated Soils (Sp, half semester).....                            | 3   |

The following courses are suggested as electives:

|  |     |
|--|-----|
| <b>ASTE 3200</b> Irrigation Principles and Practices (Sp).....   | 3   |
| <b>PLSC 2100 (BLS)</b> Introduction to Horticulture (F).....   | 3   |
| <b>PLSC 2610</b> Indoor Plants and Interiorscaping (F, half semester) .....                                | 1.5 |
| <b>PLSC 3420</b> Landscape Irrigation Design (Sp) .....  | 2   |
| <b>PLSC 3700</b> Plant Propagation (F).....  | 4   |
| <b>PLSC 4800</b> Professional Turfgrass Management (Sp) .....  | 2   |
| <b>PSC 5200</b> Site-Specific Agriculture and Landscape/Horticultural Management (Sp, half semester) ..... | 3   |
| <b>SOIL 4500</b> Soil Reclamation (Sp) .....   | 3   |
| <b>SOIL 5550 (QI)</b> Soils and Plant Nutrient Bioavailability (Sp).....                                   | 3   |

### C. Turfgrass Management Emphasis (48-52 credits)

In addition to the Core Courses, students must complete the following courses for the Turfgrass Management Emphasis.

|  |   |
|--|---|
| <b>BIOL 1610</b> Biology I (F).....  | 4 |
| <b>BIOL 1620 (BLS)</b> Biology II (Sp).....  | 4 |
| <b>BIOL 3060 (QI)</b> Principles of Genetics (F,Sp,Su) .....                         | 4 |
| <b>PLSC 2620</b> Woody Plant Materials: Trees and Shrubs for the Landscape (F) ..... | 3 |
| <b>PLSC 3400</b> Landscape Management Principles and Practices (F) .....             | 3 |
| <b>PLSC 3800</b> Turfgrass Management (F) .....                                      | 3 |
| <b>PLSC 4400</b> Modern Vegetable Production (F) (3 cr) or                           |   |
| <b>PLSC 4500</b> Fruit Production (Sp even) (3 cr).....                              | 3 |
| <b>PLSC 4800</b> Professional Turfgrass Management (Sp) .....                        | 2 |

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The following courses are suggested as electives. Select a minimum of two courses from each category:

## Horticulture

|  |   |
|--|---|
| <b>ASTE 3080</b> Compact Power Units for Agricultural and Turfgrass Applications (Sp)..... | 3 |
| <b>ASTE 3200</b> Irrigation Principles and Practices (Sp).....                             | 3 |
| <b>PLSC 2200</b> Pest Management Principles and Practices (Sp).....                        | 3 |
| <b>PLSC 3300</b> Residential Landscapes (Sp).....  | 3 |
| <b>PLSC 3700</b> Plant Propagation (F).....  | 4 |
| <b>PLSC 5100</b> Landscape Irrigation Management (Sp).....                                 | 3 |
| <b>PLSC 5550</b> Weed Biology and Control (F).....   | 4 |
| <b>SOIL 4700</b> Irrigated Soils (Sp, half semester).....                                  | 3 |
| <b>WILD 5300</b> Wildlife Damage Management Principles (Sp).....                           | 3 |

## Science

|   |   |
|---|---|
| <b>BIOL 2220</b> General Ecology (F,Sp).....                                  | 3 |
| <b>BIOL 3040</b> Plants and Civilization (F).....                             | 3 |
| <b>BIOL 4400 (QI)</b> Plant Physiology (F).....                               | 4 |
| <b>BIOL 4410</b> Plant Structure (Sp).....                                    | 3 |
| <b>BIOL 4420</b> Plant Taxonomy (Sp).....                                     | 3 |
| <b>BIOL 4430</b> Introduction to Plant Pathology (Sp).....                    | 4 |
| <b>BIOL 4500</b> Applied Entomology (Sp).....                                 | 3 |
| <b>CHEM 1120 (BPS)</b> General Chemistry II (Sp).....                         | 4 |
| <b>CHEM 1215</b> General Chemistry Laboratory (F,Sp).....                     | 1 |
| <b>PLSC 3500</b> The Structure and Function of Economic Crop Plants (Sp)..... | 3 |
| <b>PLSC 5200</b> Environmental Plant Physiology (Sp).....                     | 2 |
| <b>PLSC 5210</b> Environmental Plant Physiology Laboratory (Sp).....          | 1 |
| <b>PLSC 5430</b> Plant Nutrition (F odd).....                                 | 2 |
| <b>SOIL 4000</b> Soil and Water Conservation (F).....                         | 4 |
| <b>SOIL 4500</b> Soil Reclamation (Sp).....                                   | 3 |
| <b>SOIL 5550 (QI)</b> Soils and Plant Nutrient Bioavailability (Sp).....      | 3 |
| <b>STAT 2000 (QI)</b> Statistical Methods (F,Sp).....                         | 3 |

## Business

|  |   |
|--|---|
| <b>ACCT 2010</b> Survey of Accounting I (F,Sp,Su).....   | 3 |
| <b>ASTE 3050 (CI)</b> Technical and Professional Communication Principles in Agriculture (F,Sp)..... | 3 |
| <b>BA 3500</b> Fundamentals of Marketing (F,Sp,Su).....  | 3 |
| <b>ECON 1500 (BAI)</b> Introduction to Economic Institutions, History, and Principles (F,Sp,Su)..... | 3 |
| <b>MHR 2050</b> Legal and Ethical Environment of Business (F,Sp,Su).....                             | 3 |
| <b>MHR 3110 (DSS)</b> Managing Organizations and People (F,Sp,Su).....                               | 3 |
| <b>MHR 3710</b> Developing Team and Interpersonal Skills (F,Sp).....                                 | 3 |

## D. Business Emphasis (48 credits)

In addition to the Core Courses, select 30 credits from the following courses. Those marked with an asterisk (\*) are required.

|   |     |
|---|-----|
| <b>BIOL 1610*</b> Biology I (F).....  | 4   |
| <b>PLSC 2100 (BLS)</b> Introduction to Horticulture (F).....                        | 3   |
| <b>PLSC 2200*</b> Pest Management Principles and Practices (Sp).....                | 3   |
| <b>PLSC 2600</b> Annual and Perennial Plant Materials (F, half semester).....       | 1.5 |
| <b>PLSC 2620</b> Woody Plant Materials: Trees and Shrubs for the Landscape (F)..... | 3   |
| <b>PLSC 3050</b> Greenhouse Management and Crop Production (Sp).....                | 4   |
| <b>PLSC 3300</b> Residential Landscapes (Sp).....                                   | 3   |
| <b>PLSC 3400*</b> Landscape Management Principles and Practices (Sp).....           | 3   |
| <b>PLSC 3500*</b> The Structure and Function of Economic Crop Plants (Sp).....      | 3   |
| <b>PLSC 3700</b> Plant Propagation (F).....   | 4   |
| <b>PLSC 3800</b> Turfgrass Management (F).....                                      | 3   |
| <b>PLSC 4400*</b> Modern Vegetable Production (F).....                              | 3   |
| <b>PLSC 4500*</b> Fruit Production (Sp even).....                                   | 3   |
| <b>PLSC 5200</b> Environmental Plant Physiology (Sp).....                           | 2   |

|   |   |
|---|---|
| <b>PLSC 5210</b> Environmental Plant Physiology Laboratory (Sp).....      | 1 |
| <b>PLSC 5550*</b> Weed Biology and Control (F).....                       | 4 |
| <b>PSC 2800</b> Fundamentals of Organic Agriculture (Sp).....             | 3 |
| <b>SOIL 4500</b> Soil Reclamation (Sp).....                               | 3 |
| <b>SOIL 4700</b> Irrigated Soils (Sp, half semester).....                 | 3 |
| <b>SOIL 5550 (QI)*</b> Soils and Plant Nutrient Bioavailability (Sp)..... | 3 |

The following courses are required for a Business Minor and the Business Emphasis:

|  |   |
|--|---|
| <b>ACCT 2010</b> Survey of Accounting I (F,Sp,Su).....                   | 3 |
| <b>BA 3460</b> Fundamentals of Personal Investing.....                   | 3 |
| <b>BA 3500</b> Fundamentals of Marketing (F,Sp,Su).....                  | 3 |
| <b>MHR 2050</b> Legal and Ethical Environment of Business (F,Sp,Su)..... | 3 |
| <b>MHR 3110 (DSS)</b> Managing Organizations and People (F,Sp,Su).....   | 3 |

Complete one of the following courses:

|   |   |
|---|---|
| <b>ACCT 2020</b> Survey of Accounting II (F,Sp,Su).....                     | 3 |
| <b>BA 3700</b> Operations Management (F,Sp,Su).....                         | 3 |
| <b>MIS 2100</b> Principles of Management Information Systems (F,Sp,Su)..... | 3 |
| <b>ECON 3400 (DSS)</b> International Economics for Business (F,Sp,Su).....  | 3 |

## E. Science Emphasis (48 credits minimum)

In addition to the Core Courses, students must select 44 credits from the following courses for the Science Emphasis. Those marked with an asterisk (\*) are required.

|  |   |
|--|---|
| <b>BIOL 1610*</b> Biology I (F).....   | 4 |
| <b>BIOL 1620 (BLS)*</b> Biology II (Sp).....   | 4 |
| <b>BIOL 3060 (QI)*</b> Principles of Genetics (F,Sp,Su).....                           | 4 |
| <b>BIOL 4400 (QI)*</b> Plant Physiology (F).....                                       | 4 |
| <b>BIOL 4410</b> Plant Structure (Sp).....   | 3 |
| <b>CHEM 1120 (BPS)</b> General Chemistry II (Sp).....                                  | 4 |
| <b>CHEM 1215</b> Chemical Principles Laboratory I (F,Sp).....                          | 1 |
| <b>CHEM 1220 (BPS)</b> Principles of Chemistry II (F,Sp,Su).....                       | 4 |
| <b>CHEM 1225</b> Chemical Principles Laboratory II (F,Sp).....                         | 1 |
| <b>CHEM 2310</b> Organic Chemistry I (F).....  | 4 |
| <b>CHEM 2320</b> Organic Chemistry II (Sp).....  | 4 |
| <b>CHEM 3700</b> Introductory Biochemistry (Sp).....                                   | 3 |
| <b>CHEM 3710</b> Introductory Biochemistry Laboratory (Sp).....                        | 1 |
| <b>MATH 1060</b> Trigonometry (F,Sp,Su).....   | 2 |
| <b>MATH 1100 (QL)*</b> Calculus Techniques (F,Sp,Su).....                              | 3 |
| <b>PHYS 1200 (BPS)</b> Introduction to Physics by Hands-on Exploration.....            | 4 |
| <b>PLSC 3700</b> Plant Propagation (F).....  | 4 |
| <b>PLSC 4400*</b> Modern Vegetable Production (F).....                                 | 3 |
| <b>PLSC 4500*</b> Fruit Production (Sp).....   | 3 |
| <b>PLSC 5200*</b> Environmental Plant Physiology (Sp).....                             | 2 |
| <b>PLSC 5210</b> Environmental Plant Physiology Laboratory (Sp).....                   | 1 |
| <b>PLSC 5430</b> Plant Nutrition (F odd).....  | 2 |
| <b>PLSC 5440</b> Plant Molecular, Cellular, and Developmental Biology I (Sp even)..... | 3 |
| <b>PLSC 5450</b> Plant Molecular, Cellular, and Developmental Biology II (Sp odd)..... | 3 |
| <b>PLSC 5600</b> Plant Water Relations (F).....  | 2 |
| <b>PLSC 5760</b> Crop Ecology (Sp).....  | 2 |
| <b>PSC 2800</b> Fundamentals of Organic Agriculture (Sp).....                          | 3 |
| <b>SOIL 3200 (DSC)</b> Microbes in Environmental Action (Sp).....                      | 3 |
| <b>SOIL 4500</b> Soil Reclamation (Sp).....  | 3 |
| <b>SOIL 5550 (QI)*</b> Soils and Plant Nutrient Bioavailability (Sp).....              | 3 |
| <b>STAT 3000 (QI)</b> Statistics for Scientists (F,Sp,Su).....                         | 3 |
| Select any Ornamental Horticulture class*.....   | 3 |

Select one of the following:

|  |   |
|--|---|
| <b>BIOL 4430</b> Introduction to Plant Pathology (Sp)..... | 4 |
| <b>BIOL 4500</b> Applied Entomology (Sp).....              | 3 |
| <b>PLSC 5550</b> Weed Biology and Control (F).....         | 4 |

# Department of Plants, Soils, and Climate

## Sample Curriculum for Horticulture Major— Ornamental Horticulture Emphasis

The sample curriculum shows most lower-division courses selected freshman and sophomore years, and most upper-division courses selected junior and senior years.

### Freshman Year (29 credits)

#### Fall Semester (15 credits)

|  |   |
|--|---|
| BIOL 1610 <sup>13</sup> Biology I.....   | 4 |
| ENGL 1010 (CL1) Introduction to Writing: Academic Prose .....                                    | 3 |
| PLSC 2620 <sup>13</sup> Woody Plant Materials: Trees and Shrubs<br>for the Landscape .....       | 3 |
| PLSC 2650 <sup>12</sup> Identification and Selection of Plants in Production<br>Agriculture..... | 1 |
| PSC 1050 <sup>12</sup> Plants, Soils, and Climate Orientation .....                              | 1 |
| Any USU elective course(s) <sup>14</sup> .....   | 3 |

#### Spring Semester (14 credits)

|   |   |
|---|---|
| BIOL 1620 (BLS) <sup>13</sup> Biology II .....                    | 4 |
| MATH 1050 (QL) <sup>12</sup> College Algebra .....                | 4 |
| OSS 1400 <sup>12</sup> Microcomputer Applications .....           | 3 |
| WILD 2200 (BLS) <sup>12</sup> Ecology of Our Changing World ..... | 3 |

### Sophomore Year (29.5 credits)

#### Fall Semester (15.5 credits)

|  |     |
|--|-----|
| CHEM 1110 (BPS) <sup>12</sup> General Chemistry I .....                              | 4   |
| ENGL 2010 (CL2) Intermediate Writing: Research Writing in a<br>Persuasive Mode ..... | 3   |
| PLSC 2600 <sup>13</sup> Annual and Perennial Plant Materials.....                    | 1.5 |
| Any Breadth American Institutions (BAI)/USU course, as required .....                | 3   |
| Any emphasis elective course(s), as advised.....                                     | 4   |

#### Spring Semester (14 credits)

|   |   |
|---|---|
| PLSC 4500 <sup>13</sup> Fruit Production .....                  | 3 |
| SOIL 3000 <sup>12</sup> Fundamentals of Soil Science .....      | 4 |
| Any Breadth Social Sciences (BSS)/USU course, as required ..... | 3 |
| Any emphasis elective course(s), as advised .....               | 4 |

### Junior Year (31 credits)

#### Fall Semester (15 credits)

|  |   |
|--|---|
| PLSC 4400 <sup>13</sup> Modern Vegetable Production .....  | 3 |
| Any Breadth Humanities (BHU)/USU course, as required ..... | 3 |
| Any Depth Social Sciences (DSS) course.....                | 3 |
| Any emphasis elective course(s), as advised.....           | 3 |
| Any USU elective course(s) <sup>14</sup> .....             | 3 |

#### Spring Semester (16 credits)

|   |   |
|---|---|
| SOIL 5550 (QI) <sup>13</sup> Soils and Plant Nutrient Bioavailability ..... | 3 |
| Any USU elective courses <sup>14</sup> .....                                | 6 |
| Any emphasis elective courses, as advised.....                              | 7 |

### Senior Year (34 credits)

#### Fall Semester (17 credits)

|   |   |
|---|---|
| BIOL 3060 (QI) <sup>13</sup> Principles of Genetics.....                                      | 4 |
| PSC 3890 (CI) <sup>12</sup> Preparation for Careers in Plants, Soils,<br>and/or Climate ..... | 1 |
| PSC 4250 <sup>12</sup> Internship in Plants, Soils, and/or Climate .....                      | 2 |
| Any Depth Humanities and Creative Arts (DHA) course .....                                     | 3 |
| Any emphasis elective course(s), as advised.....  | 4 |
| Any USU elective course(s) <sup>14</sup> .....  | 3 |

#### Spring Semester (17 credits)

|   |   |
|---|---|
| PSC 4890 (CI) <sup>12</sup> Senior Seminar.....               | 1 |
| Any Breadth Creative Arts (BCA)/USU course, as required ..... | 3 |
| Any Quantitative Intensive (QI) course.....                   | 3 |

|   |   |
|---|---|
| Any emphasis elective courses, as advised ..... | 7 |
| Any USU elective course(s) <sup>14</sup> .....  | 3 |

## Sample Curriculum for Horticulture Major— Landscape Maintenance and Construction Emphasis

The sample curriculum shows most lower-division courses selected freshman and sophomore years, and most upper-division courses selected junior and senior years.

### Freshman Year (29 credits)

#### Fall Semester (16 credits)

|  |   |
|--|---|
| BIOL 1610 <sup>15</sup> Biology I.....   | 4 |
| ENGL 1010 (CL1) Introduction to Writing: Academic Prose .....                                    | 3 |
| LAEP 1200 <sup>15</sup> Basic Graphics in Landscape Architecture .....                           | 4 |
| PLSC 2620 <sup>15</sup> Woody Plant Materials: Trees and Shrubs<br>for the Landscape .....       | 3 |
| PLSC 2650 <sup>12</sup> Identification and Selection of Plants in Production<br>Agriculture..... | 1 |
| PSC 1050 <sup>12</sup> Plants, Soils, and Climate Orientation .....                              | 1 |

#### Spring Semester (13 credits)

|   |   |
|---|---|
| MATH 1050 (QL) <sup>12</sup> College Algebra .....                    | 4 |
| OSS 1400 <sup>12</sup> Microcomputer Applications .....               | 3 |
| PLSC 2200 <sup>15</sup> Pest Management Principles and Practices..... | 3 |
| WILD 2200 (BLS) <sup>12</sup> Ecology of Our Changing World .....     | 3 |

### Sophomore Year (32.5 credits)

#### Fall Semester (16.5 credits)

|  |     |
|--|-----|
| CHEM 1110 (BPS) <sup>12</sup> General Chemistry I .....                              | 4   |
| ENGL 2010 (CL2) Intermediate Writing: Research Writing in a<br>Persuasive Mode ..... | 3   |
| LAEP 2600 (QI) <sup>15</sup> Landscape Construction I.....                           | 4   |
| PLSC 2600 <sup>15</sup> Annual and Perennial Plant Materials.....                    | 1.5 |
| SOIL 3000 <sup>12</sup> Fundamentals of Soil Science .....                           | 4   |

#### Spring Semester (16 credits)

|   |   |
|---|---|
| LAEP 3610 <sup>15</sup> Landscape Construction II.....          | 4 |
| PLSC 3300 <sup>15</sup> Residential Landscapes .....            | 3 |
| Any Breadth Social Sciences (BSS)/USU course, as required ..... | 3 |
| Any USU elective courses <sup>14</sup> .....                    | 6 |

### Junior Year (29 credits)

#### Fall Semester (14 credits)

|  |   |
|--|---|
| LAEP 3500 <sup>15</sup> Planting Design .....              | 2 |
| PLSC 4400 <sup>15</sup> Modern Vegetable Production .....  | 3 |
| Any Breadth Humanities (BHU)/USU course, as required ..... | 3 |
| Any Depth Social Sciences (DSS) course.....                | 3 |
| Any USU elective course(s) <sup>14</sup> .....             | 3 |

#### Spring Semester (15 credits)

|  |   |
|--|---|
| PLSC 3500 <sup>15</sup> The Structure and Function of Economic Crop Plants ..... | 3 |
| PSC 4250 <sup>12</sup> Internship in Plants, Soils, and/or Climate .....         | 3 |
| SOIL 4700 <sup>15</sup> Irrigated Soils.....                                     | 3 |
| Any Breadth American Institutions (BAI)/USU course, as required .....            | 3 |
| Any USU elective course(s) <sup>14</sup> .....                                   | 3 |

### Senior Year (30 credits)

#### Fall Semester (14 credits)

|   |   |
|---|---|
| PLSC 3400 <sup>15</sup> Landscape Maintenance Principles and Practices .....                  | 3 |
| PLSC 3800 <sup>15</sup> Turfgrass Management.....   | 3 |
| PLSC 5550 <sup>15</sup> Weed Biology and Control.....   | 4 |
| PSC 3890 (CI) <sup>12</sup> Preparation for Careers in Plants, Soils,<br>and/or Climate ..... | 1 |
| Any USU elective course(s) <sup>14</sup> .....  | 3 |

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## Spring Semester (16 credits)

|  |   |
|--|---|
| <b>PSC 4890 (CI)</b> <sup>12</sup> Senior Seminar.....       | 1 |
| Any Breadth Creative Arts (BCA)/USU course, as required..... | 3 |
| Any Depth Humanities and Creative Arts (DHA) course.....     | 3 |
| Any emphasis elective course(s), as advised.....             | 3 |
| Any USU elective courses <sup>14</sup> .....                 | 6 |

## Sample Curriculum for Horticulture Major— Turfgrass Management Emphasis

The sample curriculum shows most lower-division courses selected freshman and sophomore years, and most upper-division courses selected junior and senior years.

## Freshman Year (32 credits)

### Fall Semester (15 credits)

|   |   |
|---|---|
| <b>BIOL 1610</b> <sup>16</sup> Biology I.....   | 4 |
| <b>ECON 1500 (BAI)</b> Introduction to Economic Institutions,<br>History, and Principles.....           | 3 |
| <b>ENGL 1010 (CL1)</b> Introduction to Writing: Academic Prose.....                                     | 3 |
| <b>PLSC 2620</b> <sup>16</sup> Woody Plant Materials: Trees and Shrubs<br>for the Landscape.....        | 3 |
| <b>PLSC 2650</b> <sup>12</sup> Identification and Selection of Plants in Production<br>Agriculture..... | 1 |
| <b>PSC 1050</b> <sup>12</sup> Plants, Soils, and Climate Orientation.....                               | 1 |

### Spring Semester (17 credits)

|   |   |
|---|---|
| <b>BIOL 1620 (BLS)</b> <sup>16</sup> Biology II.....                    | 4 |
| <b>MATH 1050 (QL)</b> <sup>12</sup> College Algebra.....                | 4 |
| <b>OSS 1400</b> <sup>12</sup> Microcomputer Applications.....           | 3 |
| <b>WILD 2200 (BLS)</b> <sup>12</sup> Ecology of Our Changing World..... | 3 |
| Emphasis elective horticulture course, as advised.....                  | 3 |

## Sophomore Year (32 credits)

### Fall Semester (16 credits)

|  |   |
|--|---|
| <b>CHEM 1110 (BPS)</b> <sup>12</sup> General Chemistry I.....                              | 4 |
| <b>ENGL 2010 (CL2)</b> Intermediate Writing: Research Writing in a<br>Persuasive Mode..... | 3 |
| <b>PLSC 3400</b> <sup>16</sup> Landscape Management Principles and Practices.....          | 3 |
| Any Breadth Social Sciences (BSS)/USU course, as required.....                             | 3 |
| Emphasis elective horticulture course, as advised.....                                     | 3 |

### Spring Semester (16 credits)

|  |   |
|--|---|
| <b>PLSC 4500</b> <sup>16</sup> Fruit Production.....                           | 3 |
| <b>SOIL 3000</b> <sup>12</sup> Fundamentals of Soil Science.....               | 4 |
| <b>PSC 4250</b> <sup>12</sup> Internship in Plants, Soils, and/or Climate..... | 2 |
| Emphasis elective science course, as advised.....                              | 3 |
| Any USU elective course(s) <sup>14</sup> .....                                 | 4 |

## Junior Year (29 credits)

### Fall Semester (15 credits)

|  |   |
|--|---|
| <b>MHR 3110 (DSS)</b> Managing Organizations and People..... | 3 |
| Any Breadth Humanities (BHU)/USU course, as required.....    | 3 |
| Emphasis elective horticulture course, as advised.....       | 3 |
| Any USU elective courses <sup>14</sup> .....                 | 6 |

### Spring Semester (14 credits)

|   |   |
|---|---|
| <b>PLSC 4800</b> <sup>16</sup> Professional Turfgrass Management..... | 2 |
| Any Breadth Creative Arts (BCA)/USU course, as required.....          | 3 |
| Emphasis elective science course, as advised.....                     | 3 |
| Emphasis elective business course, as advised.....                    | 3 |
| Any USU elective course(s) <sup>14</sup> .....                        | 3 |

## Senior Year (26 credits)

### Fall Semester (13 credits)

|   |   |
|---|---|
| <b>PLSC 3800</b> <sup>16</sup> Turfgrass Management.....  | 3 |
| <b>PSC 3890 (CI)</b> <sup>12</sup> Preparation for Careers in Plants, Soils,<br>and/or Climate..... | 1 |
| Any Depth Humanities and Creative Arts (DHA) course.....  | 3 |
| Any Communications Intensive (CI) course.....   | 3 |
| Any USU elective course(s) <sup>14</sup> .....  | 3 |

### Spring Semester (14 credits)

|  |   |
|--|---|
| <b>BIOL 3060</b> <sup>16</sup> Principles of Genetics..... | 4 |
| <b>PSC 4890 (CI)</b> <sup>12</sup> Senior Seminar.....     | 1 |
| Any Quantitative Intensive (QI) course.....                | 3 |
| Any emphasis elective course, as advised.....              | 3 |
| Any USU elective course(s) <sup>14</sup> .....             | 3 |

## Sample Curriculum for Horticulture Major— Business Emphasis

The sample curriculum shows most lower-division courses selected freshman and sophomore years, and most upper-division courses selected junior and senior years.

## Freshman Year (28 credits)

### Fall Semester (12 credits)

|   |   |
|---|---|
| <b>BIOL 1610</b> <sup>17</sup> Biology I.....   | 4 |
| <b>ENGL 1010 (CL1)</b> Introduction to Writing: Academic Prose.....                                     | 3 |
| <b>PLSC 2650</b> <sup>12</sup> Identification and Selection of Plants in Production<br>Agriculture..... | 1 |
| <b>PSC 1050</b> <sup>12</sup> Plants, Soils, and Climate Orientation.....                               | 1 |
| Any USU elective course(s) <sup>14</sup> .....  | 3 |

### Spring Semester (16 credits)

|  |   |
|--|---|
| <b>ACCT 2010</b> <sup>17</sup> Survey of Accounting I.....                   | 3 |
| <b>MATH 1050 (QL)</b> <sup>12</sup> College Algebra.....                     | 4 |
| <b>OSS 1400</b> <sup>12</sup> Microcomputer Applications.....                | 3 |
| <b>PLSC 2200</b> <sup>17</sup> Pest Management Principles and Practices..... | 3 |
| <b>WILD 2200 (BLS)</b> <sup>12</sup> Ecology of Our Changing World.....      | 3 |

## Sophomore Year (32 credits)

### Fall Semester (16 credits)

|  |   |
|--|---|
| <b>BA 3500</b> <sup>17</sup> Fundamentals of Marketing.....                                | 3 |
| <b>CHEM 1110 (BPS)</b> <sup>12</sup> General Chemistry I.....                              | 4 |
| <b>ENGL 2010 (CL2)</b> Intermediate Writing: Research Writing in a<br>Persuasive Mode..... | 3 |
| Any Breadth American Institutions (BAI)/USU course, as required.....                       | 3 |
| Any emphasis elective course, as advised.....  | 3 |

### Spring Semester (16 credits)

|  |   |
|--|---|
| <b>MHR 2050</b> <sup>17</sup> Legal and Ethical Environment of Business.....           | 3 |
| <b>PLSC 3500</b> <sup>17</sup> The Structure and Function of Economic Crop Plants..... | 3 |
| <b>SOIL 3000</b> <sup>12</sup> Fundamentals of Soil Science.....                       | 4 |
| Any Breadth Social Sciences (BSS)/USU course, as required.....                         | 3 |
| Any emphasis elective course(s), as advised.....                                       | 3 |

## Junior Year (30 credits)

### Fall Semester (15 credits)

|  |   |
|--|---|
| <b>MHR 3110 (DSS)</b> <sup>17</sup> Managing Organizations and People..... | 3 |
| <b>PLSC 4400</b> <sup>17</sup> Modern Vegetable Production.....            | 3 |
| Any Breadth Humanities (BHU)/USU course, as required.....                  | 3 |
| Any emphasis elective course(s), as advised.....                           | 3 |
| Any USU elective course(s) <sup>14</sup> .....                             | 3 |

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## Spring Semester (15 credits)

|   |   |
|---|---|
| BA 3460 <sup>17</sup> Fundamentals of Personal Investing.....               | 3 |
| SOIL 5550 (QI) <sup>17</sup> Soils and Plant Nutrient Bioavailability ..... | 3 |
| Any emphasis elective course, as advised.....                               | 3 |
| Any USU elective courses <sup>14</sup> .....                                | 6 |

## Senior Year (30 credits)

### Fall Semester (16 credits)

|   |   |
|---|---|
| PLSC 5550 <sup>17</sup> Weed Biology and Control.....   | 4 |
| PSC 3890 (CI) <sup>12</sup> Preparation for Careers in Plants, Soils,<br>and/or Climate ..... | 1 |
| PSC 4250 <sup>12</sup> Internship in Plants, Soils, and/or Climate .....                      | 2 |
| Any Depth Humanities and Creative Arts (DHA) course .....                                     | 3 |
| PSC upper-division course, as advised.....  | 3 |
| Any USU elective course(s) <sup>14</sup> .....  | 3 |

### Spring Semester (14 credits)

|  |   |
|--|---|
| PLSC 4500 <sup>17</sup> Fruit Production.....                | 3 |
| PSC 4890 (CI) <sup>12</sup> Senior Seminar.....              | 1 |
| Any Breadth Creative Arts (BCA)/USU course, as required..... | 3 |
| Any USU elective courses <sup>14</sup> .....                 | 7 |

## Sample Curriculum for Horticulture Major— Science Emphasis

The sample curriculum shows most lower-division courses selected freshman and sophomore years, and most upper-division courses selected junior and senior years.

### Freshman Year (27 credits)

#### Fall Semester (13 credits)

|  |   |
|--|---|
| BIOL 1610 <sup>18</sup> Biology I.....   | 4 |
| ENGL 1010 (CL1) Introduction to Writing: Academic Prose .....                                    | 3 |
| PLSC 2650 <sup>12</sup> Identification and Selection of Plants in Production<br>Agriculture..... | 1 |
| PSC 1050 <sup>12</sup> Plants, Soils, and Climate Orientation .....                              | 1 |
| Any USU elective course(s) <sup>14</sup> .....   | 4 |

#### Spring Semester (14 credits)

|   |   |
|---|---|
| BIOL 1620 (BLS) <sup>18</sup> Biology II.....                     | 4 |
| MATH 1050 (QL) <sup>12</sup> College Algebra .....                | 4 |
| OSS 1400 <sup>12</sup> Microcomputer Applications .....           | 3 |
| WILD 2200 (BLS) <sup>12</sup> Ecology of Our Changing World ..... | 3 |

### Sophomore Year (31 credits)

#### Fall Semester (14 credits)

|  |   |
|--|---|
| BIOL 4400 (QI) <sup>18</sup> Plant Physiology.....                                   | 4 |
| CHEM 1110 (BPS) <sup>12</sup> General Chemistry I.....                               | 4 |
| ENGL 2010 (CL2) Intermediate Writing: Research Writing in a<br>Persuasive Mode ..... | 3 |
| Any Breadth American Institutions (BAI)/USU course, as required .....                | 3 |

#### Spring Semester (17 credits)

|   |   |
|---|---|
| SOIL 3000 <sup>12</sup> Fundamentals of Soil Science .....      | 4 |
| Any Breadth Social Sciences (BSS)/USU course, as required ..... | 3 |
| Any emphasis elective courses, as advised .....                 | 6 |
| Any USU elective course(s) <sup>14</sup> .....                  | 4 |

### Junior Year (31 credits)

#### Fall Semester (15 credits)

|  |   |
|--|---|
| PLSC 4400 <sup>18</sup> Modern Vegetable Production.....   | 3 |
| Any Breadth Humanities (BHU)/USU course, as required ..... | 3 |
| Any Depth Social Sciences (DSS) course.....                | 3 |
| Any emphasis elective course(s), as advised.....           | 3 |
| Any USU elective course(s) <sup>14</sup> .....             | 3 |

## Spring Semester (16 credits)

|   |   |
|---|---|
| PLSC 4500 <sup>18</sup> Fruit Production .....                              | 3 |
| SOIL 5550 (QI) <sup>18</sup> Soils and Plant Nutrient Bioavailability ..... | 3 |
| Any USU elective course(s) <sup>14</sup> .....                              | 4 |
| Any emphasis elective courses, as advised .....                             | 6 |

## Senior Year (32 credits)

### Fall Semester (16 credits)

|   |   |
|---|---|
| MATH 1100 (QL) <sup>18</sup> Calculus Techniques.....   | 3 |
| PSC 3890 (CI) <sup>12</sup> Preparation for Careers in Plants, Soils,<br>and/or Climate ..... | 1 |
| PSC 4250 <sup>12</sup> Internship in Plants, Soils, and/or Climate .....                      | 2 |
| Any Depth Humanities and Creative Arts (DHA) course .....                                     | 3 |
| Any USU elective courses <sup>14</sup> .....  | 7 |

### Spring Semester (16 credits)

|  |   |
|--|---|
| PLSC 5200 Environmental Plant Physiology .....               | 2 |
| BIOL 3060 (QI) <sup>18</sup> Principles of Genetics.....     | 4 |
| PSC 4890 (CI) <sup>12</sup> Senior Seminar.....              | 1 |
| Any Breadth Creative Arts (BCA)/USU course, as required..... | 3 |
| Any Quantitative Intensive (QI) course.....                  | 3 |
| Any emphasis elective course, as advised.....                | 3 |

<sup>12</sup>This course is required as part of the Horticulture Major Core.

<sup>13</sup>This course is required for the Ornamental Horticulture Emphasis.

<sup>14</sup>These courses are unrestricted electives.

<sup>15</sup>This course is required for the Landscape Maintenance and Construction Emphasis.

<sup>16</sup>This course is required for the Turfgrass Management Emphasis.

<sup>17</sup>This course is required for the Business Emphasis.

<sup>18</sup>This course is required for the Science Emphasis.

## Environmental Soil/Water Science Major Preparatory Core Courses (43-49 credits)

### Required Courses (18 credits)

|   |   |
|---|---|
| BIOL 1610 Biology I (F).....  | 4 |
| BIOL 1620 (BLS) Biology II (Sp).....  | 4 |
| GEO 1110 (BPS) The Dynamic Earth: Physical Geology (F,Sp).....  | 4 |
| STAT 2000 (QI) Statistical Methods (F,Sp) (3 cr) or<br>STAT 3000 (QI) Statistics for Scientists (F,Sp,Su) (3 cr)..... | 3 |
| WILD 2200 (BLS) Ecology of Our Changing World (F,Sp) (3 cr) or<br>BIOL 2220 General Ecology (F,Sp) (3 cr).....        | 3 |

### Chemistry Courses (9 or 13 credits)

Complete one of the two following blocks of Chemistry courses:

#### Block 1 (9 credits)

|  |   |
|--|---|
| CHEM 1110 (BPS) General Chemistry I (F,Sp).....    | 4 |
| CHEM 1115 General Chemistry Laboratory (F,Sp)..... | 1 |
| CHEM 1120 (BPS) General Chemistry II (Sp).....     | 4 |

#### Block 2 (13 credits)<sup>19</sup>

|   |   |
|---|---|
| CHEM 1210 Principles of Chemistry I (F,Sp).....           | 4 |
| CHEM 1215 Chemical Principles Laboratory I (F,Sp).....    | 1 |
| CHEM 1220 (BPS) Principles of Chemistry II (F,Sp,Su)..... | 4 |
| CHEM 1225 Chemical Principles Laboratory II (F,Sp).....   | 1 |
| CHEM 2300 Principles of Organic Chemistry (F).....        | 3 |

### Mathematics Courses (10 or 8 credits)

Complete one of the two following blocks of Mathematics courses:

#### Block 1 (10 credits)

|   |   |
|---|---|
| MATH 1050 (QL) College Algebra (F,Sp,Su)..... | 4 |
| MATH 1060 Trigonometry (F,Sp,Su).....         | 2 |
| MATH 1210 (QL) Calculus I (F,Sp,Su).....      | 4 |

#### Block 2 (8 credits)<sup>19</sup>

|   |   |
|---|---|
| MATH 1210 (QL) Calculus I (F,Sp,Su).....  | 4 |
| MATH 1220 (QL) Calculus II (F,Sp,Su)..... | 4 |

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## Physics Courses (8 credits)

Complete *one* of the two following blocks of Physics courses:

### Block 1 (8 credits)

|  |   |
|--|---|
| PHYS 2110 The Physics of Living Systems I        | 4 |
| PHYS 2120 (BPS) The Physics of Living Systems II | 4 |

### Block 2 (8 credits)<sup>19</sup>

|   |   |
|---|---|
| PHYS 2210 (QI) General Physics—Science and Engineering I      | 4 |
| PHYS 2220 (BPS/QI) General Physics—Science and Engineering II | 4 |

## Professional Core Courses (23 credits)

|   |   |
|---|---|
| SOIL 3000 Fundamentals of Soil Science (F)  | 4 |
| SOIL 5050 Principles of Environmental Soil Chemistry (Sp odd)                     | 3 |
| SOIL 5130 Soil Genesis, Morphology, and Classification (F)                        | 4 |
| SOIL 5310 Soil Microbiology (F even) (3 cr) <b>or</b>                             |   |
| SOIL 5550 (QI) <sup>20</sup> Soils and Plant Nutrient Bioavailability (Sp) (3 cr) | 3 |
| SOIL 5560 Analytical Techniques for the Soil Environment (Sp)                     | 2 |
| SOIL 5650 Environmental Soil Physics (F)  | 3 |
| SOIL 5750 Environmental Quality: Soil and Water (Sp)                              | 2 |
| PSC 3890 (CI) Preparation for Careers in Plants, Soils,<br>and/or Climate (F)     | 1 |
| PSC 4890 (CI) Senior Seminar (Sp)   | 1 |

<sup>19</sup>Students in the **Water Emphasis** should take the **Block 2** courses in Chemistry, Mathematics, and Physics.

<sup>20</sup>Students in the **Plant Emphasis** must select **SOIL 5550**.

## Emphases

Students must select 12 credits from one or a combination of the following three emphases.

### Soil Emphasis

|  |   |
|--|---|
| CEE 5190 Geographic Information Systems for Civil Engineers (Sp)                                 | 3 |
| CHEM 3000 (QI) Quantitative Analysis (F)   | 3 |
| CLIM/BIE/WATS 5250 Remote Sensing of Land Surfaces (Sp)  | 4 |
| GEO 3500 Mineralogy and Crystallography (F)  | 4 |
| GEO 3550 (CI) Sedimentation and Stratigraphy (F)   | 4 |
| GEO/WATS 3600 Geomorphology (F)  | 4 |
| GEO 5410 <sup>21</sup> Introduction to Clay Mineralogy (Sp)                                      | 2 |
| GEO 5600 Geochemistry (F)  | 3 |
| GEO 5630 Photogeology (Sp)   | 3 |
| PSC 5200 Site-Specific Agriculture and Landscape/Horticultural<br>Management (Sp, half semester) | 3 |
| SOIL 3100 Soils and Civilization (Sp)  | 3 |
| SOIL 3200 (DSC) Microbes in Environmental Action (Sp)  | 3 |
| SOIL 4000 Soil and Water Conservation (F)  | 4 |
| SOIL 4500 Soil Reclamation (Sp)  | 3 |
| SOIL 5310 Soil Microbiology (F even)   | 3 |
| SOIL 5320 Soil Microbiology Laboratory (F even)  | 2 |
| SOIL 5350 Wildland Soils (Sp)  | 3 |
| SOIL 5550 (QI) Soils and Plant Nutrient Bioavailability (Sp)                                     | 3 |
| WATS 4750 <sup>21</sup> Fundamentals of Remote Sensing Science (F)                               | 3 |
| WATS 4930 Geographic Information Systems (F)   | 4 |
| WATS 5930 Geographic Information Analysis (Sp)   | 3 |
| WILD 5750 Applied Remote Sensing (F)   | 3 |

### Water Emphasis

|  |   |
|--|---|
| ASTE 5260 (CI) Environmental Impacts of Agricultural Systems (F)               | 3 |
| BIE 5010 <sup>21</sup> Principles of Irrigation Engineering (F, Sp online, Su) | 3 |
| BIE 5110 <sup>21</sup> Sprinkle and Trickle Irrigation (F)                     | 4 |
| BIE 5150 <sup>21</sup> Surface Irrigation Design (F, Sp online, Su)            | 3 |
| CEE 3430 Engineering Hydrology (Sp)  | 3 |
| CHEM 3000 (QI) Quantitative Analysis (F)                                       | 3 |
| CLIM 4300 General Meteorology (F)  | 3 |
| CLIM 5250/BIE/WATS Remote Sensing of Land Surfaces (Sp)                        | 4 |
| CLIM 5500 Land-Atmosphere Interactions (Sp odd)                                | 3 |
| GEO/WATS 5150 <sup>21</sup> Fluvial Geomorphology (F)                          | 3 |
| GEO 5510 (QI) Groundwater Geology (F)  | 3 |

|   |   |
|---|---|
| GEO 5520 (CI) <sup>21</sup> Techniques of Groundwater Investigations (Sp) | 3 |
| PLSC 5200 Environmental Plant Physiology (Sp)                             | 2 |
| PLSC 5210 Environmental Plant Physiology Laboratory (Sp)                  | 1 |
| SOIL 4000 Soil and Water Conservation (F)                                 | 4 |
| SOIL 4700 Irrigated Soils (Sp, half semester)                             | 3 |
| WATS 3700 (CI) Fundamentals of Watershed Science (Sp)                     | 3 |
| WATS 4500 Limnology: Ecology of Inland Waters (Sp)                        | 3 |
| WATS 4510 Aquatic Ecology Practicum (F)                                   | 3 |
| WATS 4530 Water Quality and Pollution (F)                                 | 3 |
| WATS 5640 <sup>21</sup> Riparian Ecology and Management (Sp)              | 3 |

## Plant Emphasis

|  |     |
|--|-----|
| BIOL 2410 Plants and Fungi in the Field (Su)   | 2   |
| BIOL 4400 (QI) Plant Physiology (F)  | 4   |
| BIOL 4410 Plant Structure (Sp)   | 3   |
| BIOL 4420 Plant Taxonomy (Sp)  | 3   |
| CLIM 5500 Land-Atmosphere Interactions (Sp odd)  | 3   |
| PLSC 2100 (BLS) Introduction to Horticulture (F)   | 3   |
| PLSC 2600 Annual and Perennial Plant Materials<br>(F, half semester)                             | 1.5 |
| PLSC 2620 Woody Plant Materials: Trees and Shrubs for the<br>Landscape (F)                       | 3   |
| PLSC 3400 Landscape Management Principles and Practices (Sp)                                     | 3   |
| PLSC 3800 Turfgrass Management (F)   | 3   |
| PLSC 4280 Field Crops (F)  | 3   |
| PLSC 4320 Forage Production and Pasture Ecology (F)  | 3   |
| PLSC 4400 Modern Vegetable Production (F)  | 3   |
| PLSC 4500 Fruit Production (Sp even)   | 3   |
| PLSC 4800 <sup>21</sup> Professional Turfgrass Management (Sp)                                   | 2   |
| PLSC 5200 <sup>21</sup> Environmental Plant Physiology (Sp)                                      | 2   |
| PLSC 5210 <sup>21</sup> Environmental Plant Physiology Laboratory (Sp)                           | 1   |
| PLSC 5430 <sup>21</sup> Plant Nutrition (F odd)  | 2   |
| PLSC 5550 Weed Biology and Control (F)   | 4   |
| PLSC 5760 <sup>21</sup> Crop Ecology (Sp)  | 2   |
| PSC 2800 Fundamentals of Organic Agriculture (Sp)  | 3   |
| SOIL 4700 Irrigated Soils (Sp, half semester)  | 3   |
| WILD 3600 Wildland Plant Ecology and Identification (F)  | 4   |
| WILD 4750 (CI) Monitoring and Assessment in Natural Resource and<br>Environmental Management (F) | 3   |
| WILD 4910 Assessment and Synthesis in<br>Natural Resource Science (Sp)                           | 3   |

<sup>21</sup>Prerequisites are required for this course.

## Sample Curriculum for Environmental Soil/Water Science Major

The sample curriculum shows most lower-division courses selected freshman and sophomore years, and most upper-division courses selected junior and senior years.

### Freshman Year (31 credits)

#### Fall Semester (14 credits)

|   |   |
|---|---|
| BIOL 1610 Biology I                                     | 4 |
| ENGL 1010 (CL1) Introduction to Writing: Academic Prose | 3 |
| GEO 1110 (BPS) The Dynamic Earth: Physical Geology      | 4 |
| Any Breadth Creative Arts (BCA)/USU course, as required | 3 |

#### Spring Semester (17 credits)

|   |   |
|---|---|
| BIOL 1620 (BLS) Biology II                    | 4 |
| MATH 1050 (QL) College Algebra                | 4 |
| OSS 1400 Microcomputer Applications           | 3 |
| WILD 2200 (BLS) Ecology of Our Changing World | 3 |
| Any emphasis elective course, as advised      | 3 |

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## Sophomore Year (31 credits)

### Fall Semester (16 credits)

|   |   |
|---|---|
| CHEM 1110 (BPS) General Chemistry I.....  | 4 |
| ENGL 2010 (CL2) Intermediate Writing: Research Writing in a Persuasive Mode ..... | 3 |
| Any Breadth Humanities (BHU)/USU course, as required .....                        | 3 |
| Any Breadth Social Sciences (BSS)/USU course, as required .....                   | 3 |
| Any emphasis elective course, as advised.....                                     | 3 |

### Spring Semester (15 credits)

|  |   |
|--|---|
| CHEM 1115 General Chemistry Laboratory (1 cr) or                           |   |
| CHEM 1215 <sup>22</sup> Chemical Principles Laboratory I (1 cr) .....      | 1 |
| CHEM 1120 (BPS) General Chemistry II (4 cr) or                             |   |
| CHEM 1220 (BPS) <sup>22</sup> Principles of Chemistry II (4 cr).....       | 4 |
| SOIL 3000 Fundamentals of Soil Science.....                                | 4 |
| Any Depth Humanities and Creative Arts (DHA)/USU course, as required ..... | 3 |
| Any emphasis elective course, as advised .....                             | 3 |

## Junior Year (31 credits)

### Fall Semester (15 credits)

|  |   |
|--|---|
| MATH 1060 Trigonometry .....                                 | 2 |
| SOIL 5130 Soil Genesis, Morphology, and Classification ..... | 4 |
| STAT 2000 (QI) Statistical Methods (3 cr) or                 |   |
| STAT 3000 (QI) Statistics for Scientists (3 cr) .....        | 3 |
| Any Depth Social Sciences (DSS) course.....                  | 3 |
| Any Communications Intensive (CI) course .....               | 3 |

### Spring Semester (16 credits)

|  |   |
|--|---|
| MATH 1210 (QL) Calculus I .....                                | 4 |
| PHYS 2110 The Physics of Living Systems I .....                | 4 |
| SOIL 5050 Principles of Environmental Soil Chemistry .....     | 3 |
| SOIL 5560 Analytical Techniques for the Soil Environment ..... | 2 |
| Any emphasis elective course, as advised.....                  | 3 |

## Senior Year (31 credits)

### Fall Semester (16 credits)

|   |   |
|---|---|
| PHYS 2120 (BPS) The Physics of Living Systems II .....                | 4 |
| SOIL 5650 Environmental Soil Physics.....                             | 3 |
| Any Breadth American Institutions (BAI)/USU course, as required ..... | 3 |
| Any USU elective courses .....  | 6 |

### Spring Semester (15 credits)

|  |   |
|--|---|
| PSC 4890 (CI) Senior Seminar .....                           | 1 |
| SOIL 5550 (QI) Soils and Plant Nutrient Bioavailability..... | 3 |
| SOIL 5600 Surface Hydrologic Field Methods .....             | 3 |
| SOIL 5750 Environmental Quality: Soil and Water.....         | 2 |
| Any USU elective courses .....                               | 6 |

<sup>22</sup>Students in the **Water Emphasis** should take CHEM 1215 and 1220, rather than CHEM 1115 and 1120.

## Ornamental Horticulture Program One-year Certificate (27 credits)

The 27 credits are distributed as follows:

|   |         |
|---|---------|
| PLSC 2600 Annual and Perennial Plant Materials (F, half semester).....                  | 1.5     |
| PLSC 2620 Woody Plant Materials: Trees and Shrubs for the Landscape (F) .....           | 3       |
| Additional PLSC courses selected from Associate of Applied Science Core Classes** ..... | 18.5-20 |
| Courses selected from Approved Electives .....  | 3-5     |

\*\*Students should choose courses that emphasize either Floriculture or Landscape Horticulture.

## Ornamental Horticulture Program Associate of Applied Science Degree (60 credits)

The 60 credits are distributed as follows. Some courses require biology prerequisite courses.

### University Studies Requirements (15 credits)

|  |   |
|--|---|
| ENGL 1010 (CL1) Introduction to Writing: Academic Prose (F,Sp,Su) .                        | 3 |
| ENGL 2010 (CL2) Intermediate Writing: Research Writing in a Persuasive Mode (F,Sp,Su)..... | 3 |
| Social Sciences/Humanities Breadth Courses .....   | 6 |
| Life Sciences/Physical Sciences Breadth Course.....  | 3 |

### Professional Requirement

|  |       |
|--|-------|
| All of the Core Courses .....                  | 34-37 |
| Courses selected from Approved Electives ..... | 7-10  |

### Core Courses (34-37 credits)

|   |     |
|---|-----|
| OSS 1400 Microcomputer Applications .....   | 3   |
| PSC 1050 Plants, Soils, and Climate Orientation (F).....                            | 1   |
| PLSC 2100 (BLS) Introduction to Horticulture (F).....                               | 3   |
| PLSC 2200 Pest Management Principles and Practices (Sp).....                        | 3   |
| PLSC 2250 Occupational Experience in Agronomy and Horticulture (F,Sp,Su) .....      | 1-4 |
| PLSC 2600 Annual and Perennial Plant Materials (F, half semester).....              | 1.5 |
| PLSC 2620 Woody Plant Materials: Trees and Shrubs for the Landscape (F) .....       | 3   |
| PLSC 2650 Identification and Selection of Plants in Production Agriculture (F)..... | 1   |
| PLSC 3050 Greenhouse Management and Crop Production (Sp) .....                      | 4   |
| PLSC 3300 Residential Landscapes (Sp).....  | 3   |
| PLSC 3400 Landscape Management Principles and Practices (Sp) .....                  | 3   |
| PLSC 3700 Plant Propagation (F).....  | 4   |
| PLSC 3800 Turfgrass Management (F) .....  | 3   |

### Approved Electives (11-15 credits)

Choose electives from the following courses or choose from any courses that are part of a BS Degree in Horticulture.

|  |     |
|--|-----|
| BIOL 1610 Biology I (F).....   | 4   |
| CHEM 1110 (BPS) General Chemistry I (F,Sp).....                        | 4   |
| PLSC 2900 Special Problems in Plant Science (F,Sp,Su) .....            | 1-4 |
| PLSC 3500 The Structure and Function of Economic Crop Plants (Sp)..... | 3   |
| PLSC 4400 Modern Vegetable Production (F) .....                        | 3   |
| PLSC 4500 Fruit Production (Sp even).....                              | 3   |
| SOIL 3000 Fundamentals of Soil Science (F) .....                       | 4   |

## Minors

### Crop Biotechnology Minor (16 credits required)

The following courses are required. PLSC 3700, 5750. Select the balance of credits from the following courses. At least one of the production courses, marked with an asterisk, (\*) is required. PLSC 3500, 4280\*, 4320\*, 4400\*, 4500\*, 5200, 5550, 5700, PSC 5160, 5240, 5260.

### Agronomy Minor (16 credits required)

A minimum of 6 credits of Soil Science courses must be taken, including SOIL 3000. A minimum of 6 credits of Plant Science courses must be taken, including the following courses: PLSC 4280 and 4320. Select the balance of credits from the following courses: SOIL 4000, 4500, 4700, 5130, 5310, 5550, 5560, 5650, PLSC 2200, 3800, 4400, 5200, 5550, 5700.

# Department of Plants, Soils, and Climate

## Soil Science Minor (16 credits required)

The following course is required: SOIL 3000. Select 12 credits from the following courses: SOIL 4000, 4700, 5050, 5130, 5310, 5350, 5550, 5560, 5650, 5750.

## Ornamental Horticulture Minor (16 credits required)

The following courses are required: SOIL 2000 or 3000, PLSC 2200, 2620. Select the balance of credits from the following courses: PLSC 2100, 2600, 3050, 3300, 3400, 3700, 3800, 4400, 4500.

## Horticulture Minor (16 credits required)

SOIL 2000 or 3000 is required. Select 6 credits from the following courses: PLSC 2100, 2200, 4400, 4500, one ornamental horticulture course. Select the remaining credits from the following: PLSC 2650, 3050, 3300, 3800, PSC 2800, SOIL 3000.

## Undergraduate Research Opportunities

The Plants, Soils, and Climate Department is dedicated to providing undergraduate students with opportunities to participate with faculty members in research and creative activities. Examples of recent research include seed germination requirements, plant growth regulators, salt cedar control, pasture growth dynamics, soil-less media characteristics, gene sequencing, and essential oils from native plants. In addition to faculty mentorship of such activities, students may obtain grants of up to \$1,000 for support of their projects. For further information, students may contact any departmental faculty member, or view the research website at: <http://research.usu.edu/>

## Departmental Assessment

Review and assessment of departmental programs is a commitment of the Plants, Soils, and Climate Department. In 2002, the department completed a USDA-Cooperative State Research, Education, and Extension Service review. On an ongoing basis, the department evaluates all academic programs. More information about departmental assessment can be found at:

<http://psc.usu.edu/htm/about/assessment/>

## Departmental Honors

Students who would like to experience greater academic depth within their major are encouraged to enroll in departmental honors. Through original, independent work, Honors students enjoy the benefits of close supervision and mentoring, as they work one-on-one with faculty in select upper-division departmental courses. Honors students also complete a senior project, which provides another opportunity to collaborate with faculty on a problem that is significant, both personally and in the student's discipline. Participating in departmental honors enhances students' chances for obtaining fellowships and admission to graduate school. Minimum GPA requirements for participation in departmental honors vary by department, but usually fall within the range of 3.30-3.50. Students may enter the Honors Program at almost any stage in their academic career, including at the junior (and sometimes senior) level. The campus-wide Honors Program, which is open to all qualified students regardless of major, offers a rich array of cultural and social activities, special classes, and the benefit of Honors early registration. Interested students should contact the Honors Program, Main 15, (435) 797-2715, [honors@cc.usu.edu](mailto:honors@cc.usu.edu). Additional information can be found online at: <http://www.usu.edu/honors/>

## Additional Information

For more information about requirements for undergraduate programs and the sequence in which courses should be taken, see major requirement sheets available from the Plants, Soils, and Climate Department, or accessed online at: <http://www.usu.edu/majorsheets/>

## Graduate Programs

### Admission Requirements

See general admission requirements, pages 101-102. Departmental admission committees and potential graduate student advisors (major professors) consider previous work experience, undergraduate and graduate records and curriculum, and formal recommendations in their decisions concerning acceptance of applicants. Students without an undergraduate or graduate degree in plants, soils, biometeorology, or a closely related field may be required to complete selected undergraduate courses prior to admission as fully matriculated graduate students in the Plants, Soils, and Climate Department. Qualified applicants are occasionally denied admission because faculty members in the applicant's area of interest do not have the time or funds to advise additional students. The serious applicant is encouraged to discuss his or her goals with appropriate members of the graduate faculty prior to preparing an application.

Graduate student candidates must have scores on the verbal and quantitative portions of the Graduate Record Examination (GRE) at or above the 40th percentile. TOEFL scores of 550 or higher are required for candidates from abroad. International students with a prior degree from an English-speaking university are exempted from the TOEFL exam.

### Degree Programs and Specializations

The Master of Science and Doctor of Philosophy degrees are offered as follows: (1) **Plant Science** with specializations in crop physiology, crop production and management, molecular biology, plant breeding and cytology, plant biotechnology and tissue culture, plant nutrition, space biology, and weed science; (2) **Soil Science** with specializations in molecular biology (interdepartmental program), soil and water chemistry, soil biochemistry and ecology, soil conservation systems, soil fertility and plant nutrition, soil physics, soil-plant-water relations, soil taxonomy and genesis, and soils and irrigation; (3) **Biometeorology** with specializations in agricultural meteorology, climatology, micrometeorology, remote sensing, and turbulence in plant canopies; and (4) **Ecology**. A **Master of Professional Studies in Horticulture (MPSH)** is also offered. This program is available to out-of-state students at in-state tuition rates through WICHE-WRGP.

### Course Requirements

Course requirements leading to MS or PhD degrees are developed jointly by the student and the student's advisory committee. Course selections reflect areas of specialization. There are, however, specific departmental requirements regarding physical sciences, biological sciences, and mathematics courses, which differ depending on the area of specialization.

# Department of Plants, Soils, and Climate

## Research

Research projects vary over time, depending on funding and other factors. Students are encouraged to visit the home page websites of the graduate faculty to determine research interests and lists of recent publications. Some of the research interests in the department include (1) the control of diseases, nematodes, weeds, and other hazards to fruit, vegetable, ornamental, and field crops; (2) physiological and genetic improvement of fruit, vegetable, ornamental, and field crops (breeding and biotechnology); (3) the evolution, genetic regulation, and utilization of apomixis and other developmental phenomena of higher plants; (4) management of agronomic and horticultural production systems; (5) horticultural landscape water management; (6) soil formation and landscape evolution; (7) soil, plant, water, and nutrient relationships; (8) management of saline and sodic soils; (9) alternative land uses; (10) improved management of animal wastes and biosolids; (11) management of soil microbial processes; (12) drainage and irrigation systems; (13) adaptations to weather and weather modification; (14) analyses and modification of large-scale surface evaporation from atmospheric boundary layer measurements; (15) spatial and temporal properties of sun flecks in plant canopies; and (16) spatial variation in surface fluxes of heat and water vapor in semiarid regions.

## Financial Assistance and Assistantships

The financial awards provided by the School of Graduate Studies are listed on pages 100-101 of this catalog. The Department of Plants, Soils, and Climate does not have a formal application form for financial assistance. Most monies used to assist students in the department come from research grants controlled by individual faculty members. Negotiations for financial assistance (research assistantships or part-time employment) are made between faculty members and students. The department provides a few part-time teaching assistantships (a semester at a time). Graduate teaching assistants are responsible to their major professor and to the instructor whom they assist. The MS and PhD in Biometeorology are Western Regional Graduate Programs (see page 100).

## Career Opportunities

A broad range of career opportunities exists for students completing the MS or PhD degree from the Department of Plants, Soils, and Climate. Graduate students specializing in the plant sciences may expect to find employment as consulting scientists, or in the private sector as plant breeders, weed scientists, etc. Graduate students specializing in the soil sciences may expect to find employment as soil scientists with government agencies or in the private sector, where they may pursue careers in environmental consulting, fertilizer retail, irrigation system design, waste management, mineland reclamation, or related environmental or agricultural pursuits. Graduate students specializing in biometeorology may expect to find employment with government agencies, as consulting scientists, or with the private sector. Graduate students specializing in ecology may expect to find employment as research scientists, as consulting ecologists, or with environmental agencies. Graduate students completing the PhD may also find career opportunities in academia.

## Additional Information and Updates

Additional information and updates concerning graduate faculty and graduate student opportunities can be obtained from the web at: <http://psc.usu.edu/>

## Plants, Soils, and Climate Faculty

### Professors

*Bruce G. Bugbee*, crop physiology  
*John G. Carman*, plant reproduction and development  
*Steven A. Dewey*, weed science  
*Daniel T. Drost*, vegetable production  
*Lawrence E. Hipps*, biometeorology  
*David J. Hole*, cereal breeding  
*Roger K. Kjølgren*, urban horticulture  
*H. Paul Rasmussen*, horticulture  
*V. Philip Rasmussen*, sustainable agriculture  
*Larry A. Rupp*, ornamental horticulture  
*Ralph E. Whitesides*, weed science

### Research Professor

*Stanford A. Young*, seed production

### Adjunct Professors

*Michael C. Amacher*, soil chemistry  
*Gail E. Bingham*, micrometeorology  
*N. Jerry Chatterton*, forage/range physiology/biochemistry  
*Lynn M. Dudley*, soil physical chemistry  
*Wilford R. Gardner*, soil physics  
*Henry F. Mayland*, soil science  
*Charles W. Robbins*, soil science  
*Edward J. Souza*, plant breeding and genetics  
*John M. Stark*, microbial ecology and biogeochemistry  
*Dale R. Westermann*, soil science  
*Raymond M. Wheeler*, plant physiology  
*James L. Wright*, soil science

### Professors Emeritus

*Rulon S. Albrechtsen*, plant breeding  
*Keith R. Allred*, forage physiology  
*J. LaMar Anderson*, pomology  
*Gaylen L. Ashcroft*, biometeorology  
*William F. Campbell*, crop stress physiology  
*Wade G. Dewey*, plant breeding  
*John O. Evans*, weed science  
*Alvin R. Hamson*, horticulture  
*R. John Hanks*, soil physics  
*Anthony H. Hatch*, horticulture  
*Donald T. Jensen*, climatology  
*Jerome J. Jurinak*, soil chemistry  
*R. Paul Larsen*, horticulture  
*DeVere McAllister*, plant breeding  
*Frank B. Salisbury*, plant physiology  
*Schuyler D. Seeley*, pomology  
*R. L. Smith*, soil science  
*Alvin R. Southard*, soil classification  
*James H. Thomas*, international agronomy  
*H. Grant Vest, Jr.*, vegetable breeding  
*David R. Walker*, pomology

### Associate Professors

*Janis L. Boettinger*, soil genesis, classification and mineralogy  
*Brent L. Black*, pomology  
*Grant E. Cardon*, soil science  
*Robert R. Gillies*, biometeorology  
*Paul R. Grossl*, biogeochemist  
*Paul G. Johnson*, turfgrass science  
*Jennifer W. MacAdam*, forage production and physiology  
*Jeanette M. Norton*, soil microbiology

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## Research Associate Professor

*Esmaiel Malek*, biometeorology

## Adjunct Associate Professors

*Ari M. Ferro*, phytoremediation  
*Kevin B. Jensen*, forage breeding  
*Thomas A. Jones*, plant genetics  
*Helga Van Miegroet*, forest soils

## Assistant Professors

*Thomas C. Griggs*, agronomy  
*Scott B. Jones*, soil physics  
*Kelly L. Kopp*, water conservation/turfgrass science  
*Heidi A. Kratsch*, ornamental horticulture  
*Corey V. Ransom*, weed science  
*Dominique J. P. Roche*, small grains, breeding/genetics  
*Yajun Wu*, plant stress physiology, cell wall proteins

## Research Assistant Professor

*Raymond L. Cartee*, soils and irrigation

## Adjunct Assistant Professors

*Jayne Belnap*, biological soil crusts  
*Nathaniel Brunsell*, biometeorology  
*Shaun Bushman*, plant genetics, molecular biology  
*David G. Chandler*, surface hydrology  
*Richard T. Lamar*, environmental microbiology  
*Steven R. Larson*, research geneticist  
*Susan Meyer*, seed biology  
*Michael Peel*, plant breeding

*Joseph Robins*, plant genetics  
*Blair L. Waldron*, research geneticist

## Senior Lecturer

*D. Craig Aston*, ornamental horticulture

## Lecturer

*M. Cathryn Myers-Roche*, academic advisor

## Research Associates

*Shyrl M. Clawson*, plant breeding  
*Robert L. Newhall*, soil conservation and sustainable agriculture

## Director, Utah Botanical Gardens

*William A. Varga*, ornamental horticulture

## Director, Soil Testing Lab

*Janice Kotuby-Amacher*, soil chemistry

## Course Descriptions

Plant Science (PLSC), [click here](#)

Soil Science (SOIL), [click here](#)

Climate (CLIM), [click here](#)

Plants, Soils, and Climate (PSC), [click here](#)