

# **Department of Plant Sciences and Plant Pathology**

## **Assessment Plan**

**For majors in:**

**Horticultural Science  
Plant Science  
Plant Biotechnology**

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## **Assessment Management Structure**

The departmental undergraduate curriculum committee will be responsible for gathering assessment data, interpreting these data, and presenting the data to the department head, the faculty and university administration. The head of the department will be responsible for initiating action on recommendations from the committee or the faculty.

## **Assessment Plan by Major**

### **B.S. Horticulture, option: Horticulture Science**

#### Degree Objectives:

- Students will graduate with a strong background in basic science, and basic plant sciences including plant anatomy, plant physiology and plant taxonomy.
- Students will be knowledgeable of the applied plant sciences including plant pathology, entomology, plant propagation, weed management and integrated plant management.
- Students will possess technical knowledge of various aspects of modern horticulture such as nursery and greenhouse management, vegetable and fruit production and landscape management.
- Students will develop problem-solving skills through a combination of their knowledge in basic science, plant science and technical horticultural studies.

#### Expected Competencies:

- Students will have written and oral communication skills necessary for professional career success in the horticultural industry.
- Students will have up-to-date skills in computer applications commonly utilized in the horticulture industry.
- Students will possess adequate knowledge, and will know how to obtain information and data, in order to effectively solve current horticultural production and management issues.

#### Additional Goals:

- Upon graduation, student job placement will be 90+%.

#### Assessment Management Plan:

- Students will be given a pre- and post-test in Horticulture Science (sophomore level course), and in Landscape Management (capstone course for this major). Similar components of the two evaluation tools can be compared to assess development of student's knowledge and problem solving capabilities.

- Student and supervisor feedback following internships will be evaluated as an assessment of student preparation for a career in horticulture and employer satisfaction with the student's education.
- Percent passing rates of students on the Commercial Pesticide Applicator's Examination and the Certified Plant Professional Examination will be compiled.
- Exit interview questionnaires will be completed by graduating seniors. Data will be compiled, shared with faculty in an attempt to improve our educational offering, and compared with previous results to detect trends. The Department Head will be responsible for administration of the survey and dissemination of results.
- The capstone course will assess problem-solving skills and written and oral communication skills of students. A standardized assessment to measure the above competencies will be developed.
- Advising will be specifically assessed using forms filled in by students at regular intervals after official advising sessions.

## **B.S. Horticulture, option: Landscape Design**

### Degree Objectives:

- Students learn basic design skills to solve aesthetic and functional landscape problems.
- Students use problem-solving skills by combining knowledge in art, science and technical studies to create landscape solutions.

### Expected Competencies:

- Students will have written, oral and graphic communication skills that are necessary to convey creative solutions for landscape planning.
- Students will know the proper selection and use of plant materials for Northern Rocky Mountain landscapes.
- Students will have up-to-date skills in computer applications commonly utilized in the landscape industry.
- Students will know how to obtain information and data pertinent to site analysis and site development.
- Students will have grounds management and maintenance skills.

### Additional Goals:

- Students will maintain a portfolio of selected project work.

### Assessment Management Plan:

Collect, review, and utilize data collected through:

- Invited outside professionals' critiques of student work
- Final student portfolios of selected works
- Exit interview / advisor feedback surveys
- Pre and post-test questions in sophomore and capstone courses
- Advising will be specifically assessed using forms filled in by students at regular intervals after official advising sessions.

## **B.S. Plant Science**

The Bachelor of Science in Plant Science degree consists of two options: Crop Science and Plant Biology. In both options students are expected to become knowledgeable in plant biology; however those in the Crop Science option will focus on the more applied aspects, whereas the Plant Biology option is designed for students interested in teaching or graduate work.

### Degree Objectives:

- Students will graduate with a strong background in basic science, and basic plant sciences including chemistry, statistics, ecology, genetics, plant physiology, plant development, biotechnology and plant systematics.
- Students will gain practical experience through laboratory and field experience and will be encouraged to gain additional learning experiences outside the classroom by working as research assistants in faculty programs, summer jobs and internships with private industry and government agencies.
- Crop Science graduates should be well prepared to find employment in the agribusiness industry, agencies such as NRCS, lending institutions, and farming ranching.

### Expected Competencies:

- Ability to describe cellular biochemistry, genetic systems common in plants, plant morphology and development, principal aspects of plant ecology and the general types and diversity of plants.
- Ability to communicate ideas effectively both orally and in writing.
- Ability to use the knowledge gained in class to predict the response of plants under different environments from those in which a plant is normally found.
- Ability to synthesize information from different sources and apply the synthesized knowledge to novel problems

### Additional Goals:

- Many Crop Science graduates become Certified Crop Advisors (CCAs). The Certified Crop Advisor program is a certification program for professionals

providing crop production advice to producers. The program requires the applicant pass both a national and state exam.

Assessment Management Plan:

- Students will be assessed for their general knowledge in chemistry, cell biology and plant systems in the botany course (PS251) during their sophomore year
- Students will be assessed for their overall knowledge in crop science or plant biology in the respective capstone courses for the two curricula, LRES 428C and BIOL 443C.
- Students will be interviewed to obtain feedback on courses and curriculum. The student's advisor will be responsible for this interview.
- Advising will be specifically assessed using forms filled in by students at regular intervals after official advising sessions.

**B.S. Biotechnology, Plant Systems Option**

The Bachelor of Science in Biotechnology is an interdisciplinary degree offered by the Departments of Plant Sciences and Plant Pathology, Veterinary Molecular Biology (College of Agriculture) and Microbiology (College of Letters and Sciences). The Department of Plant Sciences and Plant Pathology is directly responsible for the Plant Systems Option within this degree.

Degree Objectives:

- Students majoring in plant biotechnology will have a thorough understanding of plant function, including plant biochemistry, genetics and physiology
- Graduating plant biotechnology students are expected to be competent in the commonly used biochemical and molecular methods needed to understand plants as biological systems.

Expected Competencies:

- Students will be prepared to join industry, academic or government laboratories and participate in supervised research projects under the supervision of more experienced scientists.
- Students will be competent in organizing routine day-to-day laboratory activities within a research project, generate and analyze data, and communicate these data to their supervisors and peers within their organization, in both written and oral forms.

- Students will have the preparation necessary for graduate studies in a plant science discipline.

#### Additional Goals:

- Through their specialized knowledge, plant biotechnology majors will be able to contribute to the ongoing discussion about genetically modified organisms (“GMOs”) and help people to make oriented, scientifically based decisions about their use.

#### Assessment Management Plan:

- Students will be assessed for competence in plant science and biotechnology, writing and speaking skills during the capstone course (PS429C).
- During this class, every student will be required to submit several written reports on scientific presentations; additionally, every student will prepare and present a research seminar (typically to the whole department), from their internship or other research projects.
- Interviews with students to obtain feedback on courses and curriculum will be integrated into the capstone class.
- Advising will be specifically assessed using forms filled in by students at regular intervals after official advising sessions.

#### **Plan for Utilizing Data:**

The data and results will be collected, compiled and analyzed by the Department Head and the Undergraduate Studies Committee. A summary of the results will be disseminated to all faculty and discussed as necessary. Annual results will be stored by the faculty collecting the information or in the PSPP office. Pertinent data collected during various student surveys and analyses will be used to evaluate the performance of faculty, students and to evaluate curricula.