Plant Science

Overview

This CRC program offers courses designed for students in the Agriculture, Agriculture Business, and Horticulture programs.

**PLTS 299 Experimental Offering in Plant Science**

- **Units:** 0.5 - 4
- **Prerequisite:** None.
- **Catalog Date:** June 1, 2020

**PLTS 300 Introduction to Plant Science**

- **Units:** 3
- **Hours:** 36 hours LEC; 54 hours LAB
- **Prerequisite:** None.
- **Transferable:** CSU; UC
- **General Education:** AA/AS Area IV
- **Catalog Date:** June 1, 2020

This course is designed to provide the students with a working knowledge of the fundamental structures and processes of plants. Principles to be applied cover plant structures, physiology, heredity, environmental relationship to growth, adaptation, and management of crops. Techniques of research, exploration of plant growth, and identification of economical crops will be included. Fields trips may be required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending class regularly.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Communicate effectively (orally and/or written)
- SLO 2: Demonstrate a fundamental understanding of the California agriculture industry.
- Identify the major markets of the agriculture industry and verify how these markets function in their county in the state of California.
- Identify and evaluate the various agricultural occupations and the associated employment requirements and opportunities.
- Identify and evaluate common practices of various agricultural business types.
- SLO 3: Demonstrate a fundamental understanding of basic botany and plant genetics as it relates to plant science and production agriculture.
- Assess the role of plant cells, cells structures, and basic genetics in vegetative development, plant growth, and plant production.
- Recognize the major structures of plants and explain the function of each major plant structure.
- Identify and explain the requirements of plant growth.
- Explain plant identification and botanical terminology.
- Examine the role of plants in genetic engineering and biotechnology.
- Analyze the characteristics and qualities of agronomic, vegetable, and ornamental crops.
- Assess plant propagation through sexual and asexual methods.
- SLO 4: Demonstrate a fundamental understanding of soils and soil-water, soil-water-plant relationships. Explain soil development and structure, and describe sustainable soil maintenance and management practices.
- Evaluate various plant species' nutritional needs, and measure, mix, and apply fertilizers.
- Evaluate soil-water and soil-water-plant relationships.
- Evaluate water efficient irrigation methods and estimate watering needs.
- SLO 5: Demonstrate a fundamental understanding of common agricultural practices.
- Identify common agricultural / horticultural tools and equipment.
- Describe the methods utilized to plant and care for various crops.
- Compare various cultural practices, and the resulting effect of each on plant health and development.
- Describe the process of plant selection.
- Recognize symptoms and signs of plant diseases and pests, and identify past damage.
- Identify and explain common integrated pest management practices.
- Analyze the methods and practices utilized in the establishment, production, and management of vegetable crops.
- Analyze the methods and practices utilized in the establishment, production, and management of fruit and nut crops.
- Analyze the methods and practices utilized in the establishment, production, and management of flower and foliage crops.
- Analyze the methods and practices utilized in the establishment, production, and management of forage and ornamental grasses.
- Evaluate the some of the roles plants play in herbology and pharmacology.

PLTS 310 Soils, Soil Management, and Plant Nutrition

This course provides a basic knowledge of the physical, chemical, and biological properties of soils. The course includes factors of: fundamental soil properties, soil and plant relationships, principles of soil formation, fertilizers and soil management, salinity, pH, erosion management, and non-agricultural uses. Field trips may be required. This course is the same as Hort 302, and only one may be taken for credit.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.

- SLO 2: Demonstrate a fundamental understanding of the physical and chemical properties of soils.
- Compare the textural classes of soil through laboratory analysis.
- Explain the role of soil structure and evaluate the effects of tillage management in soil productivity.

- SLO 3: Demonstrate a fundamental understanding of the role of soil in plant nutrition.
- Identify the chemical elements necessary for plant growth through laboratory analysis.
- Diagnose common chemical deficiency and toxicity symptoms.
- Examine common cultural practices utilized to keep a soil’s nutritional elements the in an adequate supply and proper balance.
- Validate the fundamentals of plant nutrition through laboratory analysis.

- SLO 4: Demonstrate a fundamental understanding of best soil management practices in sustainable horticulture.
- Explain why our soils, as a natural resource, must be managed and preserved.
- Demonstrate how to effectively manage the physical, chemical, and biological properties of soils for sustained productivity.
- Examine the methods and means of utilizing organic matter to improve soil structure, support soil biology, and to maintain and stimulate soil health.
- Analyze the effects of soil compaction in crop production and horticultural situations, and explain common methods utilized to alleviate soil compaction.
- Analyze the effects of soil erosion in crop production and horticultural situations, and explain common methods utilized to prevent soil erosion.

- SLO 5: Explain why irrigated soils must be managed in special ways to preserve its productivity.
- Explain the effects of salts and high sodium levels on soil structure, pH, drainage, and plant productivity.
- Validate the fundamentals of soil management through laboratory analysis.

PLTS 332 Integrated Pest Management

This course is a study of local plant pests including weeds, diseases, invertebrates, and vertebrates. It includes recognition of symptoms and causes, life cycle of the pests, host and habitat relationships, and the integrated pest management strategies and best management practices to achieve control. Field trips may be required. This course is the same as Hort 303, and only one may be taken for credit.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending or logging into class regularly.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.

- SLO 2: Demonstrate a fundamental understanding of jobsite safety and effective and efficient work habits.
- Validate and demonstrate safety consciousness in work dress/apparel, tool use, jobsite demeanor, and personal protective equipment use.
- Assess jobsite hazards, reduce work related risks, and influence others to work in a safe and efficient manner.
- Select appropriate personal protective equipment for a given pesticide.
- Demonstrate the safe and efficient use of pesticide application equipment.
- SLO 3: Assess, evaluate, and implement the principles and practices of integrated pest management.
- Evaluate the economic significance of plant pest problems in horticulture.
- Assess the reasons conventional pest control options are no longer desirable.
- Demonstrate the ability to diagnose and analyze pest damage, recommend integrated pest management strategies, and select proper control measures.
- Identify insects and closely related plant pests, common diseases and abiotic plant disorders, weed species, and beneficial organisms as evident from existing signs and symptoms.
- Compare and contrast various methods of conventional and integrated pest management strategies.
- Demonstrate the ability to safely and accurately prepare pesticide application equipment.
- Demonstrate the ability to safely and efficiently operate pesticide application equipment through the application of pesticide materials during a simulated exercise.
- Formulate a seasonal pest management plan using the principles of integrated pest management.
- SLO 4: Demonstrate a fundamental understanding of licensing and/or certification, and business and professional standards in integrated pest management.
- Analyze landscape pest management professions and identify and explain requirements for employment and/or licensing or certification.
- Recognize and explain the benefits of additional/supplemental licensing and certification through state agencies and professional associations.
- Examine and explain the California state Department of Pesticide Regulation laws and regulations, and the CDPR rules governing the Qualified Applicator’s Certificate and Landscape Maintenance Gardener’s pesticide license.
- Validate and demonstrate the importance of professionalism in the landscape industry, and described the professional industry associations and certification programs.
- Recognize and explain the standard practices of various types of landscape construction/maintenance businesses, including estimating and bidding procedures, business practices, and working with state agencies.

### PLTS 495 Independent Studies in Plant Science

| Units: | 1 - 3 |
| Hours: | 54 - 162 hours LAB |
| Prerequisite: | None. |
| Transferable: | CSU |
| Catalog Date: | June 1, 2020 |

An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of "Special Studies" for full details of Independent Studies.

#### Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Actively engage in intellectual inquiry beyond that required in order to pass a course of study (College Wide Learning Outcome – Area 4).
- Discuss and outline a proposal of study (that can be accomplished within one semester term) with a supervising instructor qualified within the discipline.
- Design an independent study (to be completed individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
- Use information resources to gather discipline-specific information.
- SLO #2: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in the major discipline of study to significant problems and/or educational activities (College Wide Learning Outcome – Area 3).
- Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in the major discipline of study.
- Explain the importance of the major discipline of study in the broader picture of society.
- SLO #3: Communicate a complex understanding of content matter of the major discipline of study (College Wide Outcome – Area 3).
- Demonstrate competence in the skills essential to mastery of the major discipline of study that are necessary to accomplish the independent study.
- SLO #4: Identify personal goals and pursue these goals effectively (College Wide Outcome – Area 4).
- Utilize skills from the “academic tool kit” including time management, study skills, etc., to accomplish the independent study within one semester term.

### PLTS 498 Work Experience in Plant Science

| Units: | 1 - 4 |
| Hours: | 60 - 300 hours LAB |
| Prerequisite: | None. |
| Enrollment Limitation: | Students must be in a paid or unpaid internship, volunteer position or job related to career goals in Plant Science. |
| Transferable: | CSU |
| General Education: | AA/AS Area III(b) |
| Catalog Date: | June 1, 2020 |

This course provides students with opportunities to develop marketable skills in preparation for employment in their major field of study or advancement within their career. It is designed for students interested in work experience and/or internships in transfer level degree occupational programs. Course content includes understanding the application of education to the workforce; completion of required forms which document the student’s progress and hours spent at the work site; and developing workplace skills and competencies. Appropriate level learning objectives are established by the student and the employer. During the semester, the student is required to participate in a weekly orientation and 75 hours of related paid work experience, or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. Work Experience may be taken for a total of 16 units when there are new or expanded learning objectives. Only one Work Experience course may be taken per semester.

#### Student Learning Outcomes

Upon completion of this course, the student will be able to:

- DEMONSTRATE AN UNDERSTANDING AND APPLICATION OF PROFESSIONAL WORKPLACE BEHAVIOR IN A FIELD OF STUDY RELATED ONE’S CAREER.(SLO 1)
- Understand the effects time, stress, and organizational management have on performance.
- Demonstrate an understanding of consistently practicing ethics and confidentiality in a workplace.
- learn the career/life planning process and relate its relevancy to the student.
- Demonstrate an understanding of basic communication tools and their appropriate use.
- Demonstrate an understanding of workplace etiquette.
- DESCRIBE THE CAREER/LIFE PLANNING PROCESS AND RELATE ITS RELEVANCY TO ONE'S CAREER (SLO 2)
- Link personal goals to long term achievement.
- Display an understanding of creating a professional first impression.
- Understand how networking is a powerful job search tool.
- Understand necessary elements of a résumé.
- Understand the importance of interview preparation.
- Identify how continual learning increases career success.
- DEMONSTRATE APPLICATION OF INDUSTRY KNOWLEDGE AND THEORETICAL CONCEPTS AS WRITTEN IN LEARNING OBJECTIVES IN PARTNERSHIP WITH THE EMPLOYER WORK SITE SUPERVISOR (SLO 3)

PLTS 499 Experimental Offering in Plant Science

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