AGRI 0160 - METHODS OF PROPAGATION

Catalog Description

Hours: 90 (36 lecture, 54 laboratory)
Description: Plant propagation and production practices with a focus on nursery operations. Topics include sexual and asexual reproduction, planting and transplanting, fertilization, pest and disease management, site layout and structures, preparation and use of propagation and planting media, proper use and maintenance of common tools and equipment, and regulations governing plant production. (CSU)

Course Student Learning Outcomes

- CSLO #1: Demonstrate proficiency in plant propagation using seeds, rooting cuttings, grafting, budding, layering, and micropropagation (tissue culture).
- CSLO #2: Evaluate how plant growth stage, maturity, and environmental conditions affect plant propagation success.
- CSLO #3: Apply plant propagation concepts to solve problems and explain the scientific basis and appropriate application of each technique.
- CSLO #4: Connect wholesale plant propagation to the production of food and nursery crops for human consumption and use.

Effective Term

Fall 2026

Course Type

Credit - Degree-applicable

Contact Hours

90

Outside of Class Hours

72

Total Student Learning Hours

162

Course Objectives

Lecture Objectives

1. Explain how temperature, water, humidity, and soil quality or fertility affect plant growth.

2. Describe the principles of sexual and asexual plant reproduction.

3. Discuss control methods for at least ten common garden, landscape, crop, or greenhouse pests.

4. Plan and design a nursery layout based on given parameters.

5. Describe the major types of wholesale plant production industries locally and in California, and related career opportunities.

6. Determine the crop cycle for seed-propagated plants.

Laboratory Objectives

1. Demonstrate the ability to grow plants from propagation to salable size by mastering these skills:

   (a) Applying plant propagation methods such as seed, cuttings, budding, grafting, layering, division, and micropropagation (tissue culture).

   (b) Determining proper timing for specific plant species and propagation methods.

   (c) Preparing planting and propagating media according to a given formula.

   (d) Measuring, mixing, and applying fertilizers according to label directions.

   (e) Planting and transplanting a variety of plants into appropriate containers.

   (f) Selecting and correctly applying rooting hormones for various propagation methods.

2. Exhibit the personal skills, such as attitude, work habits, (etc.) necessary for employment in the wholesale nursery industry.

3. Identify, use, and maintain common propagation and nursery tools and equipment.

4. Develop and deliver a presentation demonstrating a selected propagation method.

5. Maintain detailed propagation records, including data and progress tracking, for multiple plant species.

6. Produce accurate plant labels using a computerized labeling system.

General Education Information

- Approved College Associate Degree GE Applicability
  - AA/AS - Life Sciences
  - AS - Life Science Lab
  - AA/AS - Natural Sciences
  - AA/AS - Natural Sciences Laboratory
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- CSU Transferable

Methods of Evaluation

- Classroom Discussions
  - Example: To address lecture course objective #1, "Explain the effect of temperature, water, humidity, and soil quality/fertility on plant growth.", students might participate in a class discussion about the features of media (soil) types and the impacts on plant growth. Students could be evaluated on participation, accuracy of information and completeness of information.
- Objective Examinations

    - Example: To address lecture course objective #1, "Explain the effect of temperature, water, humidity, and soil quality/fertility on plant growth.", students might answer a question on an exam or quiz asking them to determine the outcome of plant growth based on the features of media (soil) types . Students could be evaluated on accuracy of information and completeness of information.
- Problem Solving Examinations
    - Example: Students will be provided with a case study where they are provided a scenario describing environmental and soil conditions as well as the growing requirements for a plant species, which in this scenario are not performing as they should. Scholars will need to determine what propagation and management techniques to employ to improve growth performance. Lecture Outcomes: 1,2,3,6 Laboratory Outcomes: 1(a-f)
- Projects
    - Example: Students will propagate and grow plants as a project. Tracking sheets will be used to maintain records and collect data relating to plant growth and overall plant well-being. This data will be used to make informed decisions about plant care and management needs based on environmental conditions and stage of plant growth. Students will provide a summary of management techniques and the reasons they were used. Lecture Objective 1,3,5 Laboratory Objective: 1(b,d,e),3,5
- Reports
    - Example: Students will maintain a propagation journal including descriptions of daily lab activities, and a compilation of propagation data and tracking sheets for each species propagated describing techniques, media and hormone selection, timing and weekly progress of callus formation to root initiation, growth care and maintenance, and transplant activities. Lecture Objective 3, 6 Laboratory Objective: 5
- Skill Demonstrations
    - Example: Students will demonstrate the proper technique for applying rooting hormone to the apical meristem of beans and peas. Laboratory Objective 1(f) and 4

Repeatable

No

Methods of Instruction

- Laboratory
- Lecture/Discussion

Lab:

1. The instructor may prepare a demonstration on the proper technique for applying hormone to the apical meristem of beans and peas. After demonstration, instructor will ask students to perform the task and collect experimental data weekly for three weeks. Students will have become familiar with technique by reading both lab manual and textbook, writing information in lab manual, and analyzing the outcome.

Lecture:

1. The instructor might prepare lectures that highlight, define, and compare plant tissues relating them to sexual and asexual reproduction. The lecture could include images that show where all the tissues are located and types of cells involved. Students will locate the major tissues on plants (actual plants/diagrams or models).

Typical Out of Class Assignments

Reading Assignments

1. Read peer reviewed literature on propagation principles and techniques. 2. Read current research articles on various propagation methods appropriate for application. 3. Read the assigned pages on propagation principles and techniques from the textbook and be prepared to discuss key concepts and takeaways.

Writing, Problem Solving or Performance

1. Write and maintain propagation data sheets for each species propagated describing techniques, media and hormone selection, timing and weekly progress tracking of callus formation to root initiation. 2. Read labels of various plant growth regulators used for propagation, and make selections for appropriate use on each species propagated.

Other (Term projects, research papers, portfolios, etc.)

Students will maintain a propagation journal including descriptions of daily lab activities, and a compilation of propagation data and tracking sheets for each species propagated describing techniques, media and hormone selection, timing and weekly progress of callus formation to root initiation, growth care and maintenance, and transplant activities.

Required Materials

- Plant Propagation
    - Author: Hartmann & Kester
    - Publisher: Pearson
    - Publication Date: 2017
    - Text Edition: 9th
    - Classic Textbook?: No
    - OER Link:
    - OER:
- Seed Propagation of Native California Plants
    - Author: Dara E. Emery
    - Publisher: Santa Barbara Botonic Garden
    - Publication Date: 2021
    - Text Edition: 1st
    - Classic Textbook?: Yes
    - OER Link:
    - OER:
- Propagation Techniques for Flowers, Vegetables, and Trees: Growing Plants from Seeds, Cuttings, Grafts, Division, and Bulbs (IMM Lifestyle Books) Step-by-Step Advice, Plant Directory & Troubleshooting
    - Author: Julie Hollobone
    - Publisher: IMM Lifestyle Books
    - Publication Date: 2025
    - Text Edition: 1st
    - Classic Textbook?: Yes
    - OER Link:
    - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.