HORT 70 Course Outline as of Fall 2024

CATALOG INFORMATION

Dept and Nbr: HORT 70 Title: PLANT PROPAGATION
Full Title: Plant Propagation
Last Reviewed: 11/25/2024

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	3.00	6	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00 Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	AG 92.1

Catalog Description:
Plant propagation and production practices with emphasis on nursery operations including sexual and asexual reproduction, planting, transplanting, fertilizing, plant pest and disease control; structures and site layout; preparation and use of propagating and planting mediums; use and maintenance of common tools and equipment; regulations pertaining to plant production.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 100 OR EMLS 100 (formerly ESL 100) or equivalent

Limits on Enrollment:

Schedule of Classes Information:
Description: Plant propagation and production practices with emphasis on nursery operations including sexual and asexual reproduction, planting, transplanting, fertilizing, plant pest and disease control; structures and site layout; preparation and use of propagating and planting mediums; use and maintenance of common tools and equipment; regulations pertaining to plant production. (Grade or P/NP)

Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 100 OR EMLS 100 (formerly ESL 100) or equivalent
Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:	
UC Transfer:		Effective:		Inactive:	

CID:
CID Descriptor: AG - EH 116L Plant Propagation / Production
SRJC Equivalent Course(s): HORT70

Certificate/Major Applicable:
Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Describe and compare commercial practices of plant propagation by seed (sexual) and vegetative (asexual) methods.
2. Explain and apply propagation principles
3. Demonstrate plant propagation methods including seed, cuttings, grafting, layering, and division

Objectives:
At the conclusion of this course, the student should be able to:
1. Describe and compare the requirements of various sexual and asexual propagation methods used in the horticulture industry.
2. Describe common structures, containers, soil media and other supplies used in commercial plant propagation.
3. Compare sexual and asexual propagation methods for various plant species.
4. Demonstrate seed sowing techniques for a variety of plant species.
5. Describe the physiological processes and environmental requirements of seed germination.
6. Evaluate cuttings collected from stock plants for their likelihood of success in cutting propagation.
7. Describe the physiological processes of wound-healing and root formation in vegetative propagation techniques.
8. Understand the influence of hormone treatments, wounding, and other methods on rooting success of cuttings.
9. Describe the ideal environmental conditions for cutting propagation.
10. Select propagation equipment and structures appropriate for various plant varieties and

commercial nursery enterprises.
11. Demonstrate proper sanitation procedures in the use of propagation materials and equipment.
12. Analyze propagation methods based on desired outcomes in plant characteristics, uniformity, quality and quantity.
13. Implement plant labeling requirements associated with good propagation practices and plant patent laws.
14. Demonstrate safe and correct use and care of propagation tools and equipment.
15. Describe and compare types of nurseries based on their propagation methods.

Topics and Scope:

I. Wholesale Plant Production Operations
II. Introduction to Plant Environmental Requirements
  A. Light
  B. Temperature
  C. Water
  D. Air
  E. Anchorage
  F. Minerals
  G. Photoperiodism and its effect on plant growth
III. General Aspects of Plant Propagation
  A. Objectives in the study of plant propagation
  B. Methods of propagating plants
  C. Basic types of reproduction
IV. Use and Maintenance of Common Propagation and Nursery Tools and Equipment
V. Sexual Propagation
  A. Principles of sexual propagation and hybridization
    1. Production of flowers
    2. Production of the embryo
    3. Apomixes
    4. Fruit and seed development
    5. The mature seed
  B. The relationship of plant breeding to nursery practices
  C. Seed germination requirements and practice
  D. Seed collection and processing
  E. Discussion of various seed treatment processes
    1. Scarification
    2. Stratification
  F. Transplanting of seedlings
  G. Plug production
VI. Asexual Propagation
  A. Importance and reasons for using asexual propagation
  B. The clone
  C. The plant patent law
  D. Different types of asexual propagation
VII. Cuttings
  A. Requirements of cutting propagation
    1. Moisture
    2. Temperature
    3. Media
    4. Hormones
    5. Disease prevention

6. Mother stock
B. Types of cuttings
1. Hardwood, semi-hardwood, softwood, and herbaceous cuttings
2. Stem (tip, straight, heel, mallet, cane), leaf (segments, leaf bud, leaf vein, leaf petiole), root cuttings
C. Hardening off of cuttings
D. Potting and canning cuttings
E. Seasonal timing and programming of cutting production

VIII. Grafting and Budding
A. Theoretical aspects
1. Reasons for Grafting and Budding
2. Formation of the graft union
3. Healing of the graft or bud
4. Polarity in grafting
5. Grafting incompatibility (rootstock selection, interstock)
6. Rootstock - scion relationships
B. Techniques of Grafting
1. Methods
2. Tools and materials
3. Selection and storage of scion wood
4. Grafting classified according to placement
5. Aftercare of grafted trees
C. Techniques of Budding
1. Methods
2. Seasonal timing
3. Wrapping buds
D. Rootstock selection
1. Fruiting species
2. Ornamental species

IX. Other Common Propagation Methods
A. Layering
B. Division

X. Micropropagation/Tissue Culture
A. Overview of micropropagation in horticultural crops
1. Taking of explants
2. Culture in sterile media
3. Multiplication
4. Transplanting
B. Micropropagation facilities and techniques
C. Evaluation of micropropagation methods applied to various horticultural crops
D. Plants commonly propagated by micropropagation methods

XI. Cultural Considerations of Plant Production
A. Planting media formulation and usage
B. Fertilizing and watering of plant stock
C. Planting and transplanting nursery stock in a variety of containers
D. Pruning, Pinching, Disbudding
E. Chemical growth regulation
F. Controlling insect and disease pests of nursery stock
G. Preparation of nursery stock for sale
H. Purchasing nursery stock for growing on or reselling
I. Labeling/growing standards for retail sales and ads

XII. Propagation and Growing Structures

A. The greenhouse environment
B. Cold frames and hot beds
C. Shade structures and growing blocks

NOTE: All topics covered in lecture are also covered in lab.

Assignment:

Lecture-Related Assignments:
1. Weekly reading assignments and homework
2. Lecture quizzes (2 - 12)
3. Research report (1 - 3)
4. Midterm & Final Exam

Lab-Related Assignments:
1. Lab exercises and/or reports (6-16)
2. Propagation project
3. Lab Quizzes (2 - 12)
4. Field trips may be required

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Homework, Research report	Writing 10 - 30%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Propagation project	Problem solving 20 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Lab exercises and/or reports	Skill Demonstrations 10 - 20%

Exams: All forms of formal testing, other than skill performance exams.

Lecture and Lab Quizzes, Midterm & Final exam	Exams 30 - 50%

Other: Includes any assessment tools that do not logically fit into the above categories.

Participation including possible field trips	Other Category 0 - 20%

Representative Textbooks and Materials:

Hartmann and Kester's Plant Propagation: Principles and Practices. Davies, Fred and Geneve, Robert and Wilson, Sandra. 9th ed. Pearson. 2018
The Reference Manual of Woody Plant Propagation. 2nd ed. Dirr, Michael and Heuser, Charles. Timber Press. 2006 (classic)
Practical Woody Plant Propagation for Nursery Growers. MacDonald, Bruce. Timber Press. 2006 (classic)
Instructor prepared materials