

VIT 70 Course Outline as of Fall 2022**CATALOG INFORMATION**

Dept and Nbr: VIT 70 Title: VYD PEST & DISEASE MGMT

Full Title: Vineyard Pest and Disease Management

Last Reviewed: 2/7/2022

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	8	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:

Catalog Description:

Examination of vineyard pests, diseases, and vectors; including their identification, life-cycles, specific monitoring and economic thresholds. Topics include: vineyard fungal, bacterial and viral diseases, insects, and other pests. Efficient, current and environmentally sound management strategies will be emphasized.

Prerequisites/Corequisites:**Recommended Preparation:**

Course Completion or Concurrent Enrollment in VIT 55 AND Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:**Schedule of Classes Information:**

Description: Examination of vineyard pests, diseases, and vectors; including their identification, life-cycles, specific monitoring and economic thresholds. Topics include: vineyard fungal, bacterial and viral diseases, insects, and other pests. Efficient, current and environmentally sound management strategies will be emphasized. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Course Completion or Concurrent Enrollment in VIT 55 AND Eligibility for ENGL 100 or ESL 100

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 2016	Inactive:
UC Transfer:		Effective:	Inactive:

CID:

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. Identify major vineyard pests, diseases and vectors during all stages of their life-cycles.
2. Develop a year-round management plan calendar that specifies when the pests, diseases and vectors are present, their critical monitoring periods and the best timing of appropriate control measures.
3. Identify and discuss control strategies for specific vineyard pest, disease and vector that include biological, cultural, mechanical/physical and chemical methods.

Objectives:

In order to achieve these learning outcomes, during the course students will:

1. Distinguish among fungal, bacterial or viral vineyard diseases.
2. Categorize vineyard pests into insect, arthropod, nematode or vertebrate.
3. Identify specific vineyard pests, vectors and diseases and explain their life-cycles.
4. Identify specific beneficial insects, their role in potential control of which specific pest, and explanation of their life-cycles.
5. Explain the role of beneficial soil microorganisms for potential control of specific soil pests.
6. Identify symptoms and damage to grapevines and fruit associated to specific vineyard pests, vectors and diseases.
7. Monitor and record pest infestation levels and disease severity levels in a vineyard.
8. Explain an effective sampling strategy in the vineyard for monitoring pests and diseases in the vineyard.
9. Identify economic threshold levels of various vineyard pests and diseases.
10. Define and discuss integrated pest and disease management strategies for grapevines.
11. Define and discuss sustainable, organic and biodynamic methods of pest and disease management strategies for grapevines.

12. Identify and discuss control methods (biological, cultural, physical/mechanical, chemical) for specific vineyard pests, vectors and diseases.
13. Develop yearly calendar showing when pests' activity, critical monitoring periods, and timing of the various control methods for each of the pests and diseases.
14. Define pesticide, including distinctions among the various subcategories, e.g., fungicide, herbicide, etc.
15. Compare and contrast classifications and modes of action for pesticides according to their target pest(s) or disease(s).
16. Discuss the laws and regulations and the governmental agencies that have jurisdiction over the approval and use of pesticides.

Topics and Scope:

- I. Introduction
 - A. Annual growth cycle of a grapevine
 - B. Important structures and features of grapevines
 - C. Calendar of events for north coast viticulture practices
- II. Abiotic Disorders and Injuries of Grapevines
 - A. Growth problems
 - B. Water deficit associated symptoms
 - C. Weather related disorders
 - D. Spray damage
 - E. Herbicide damage
 - F. Physiological problems
- III. Diagnostic Techniques
 - A. Diagnosing vineyard pest and disease problems
 - B. Biotic vs. Abiotic problems
 - C. Spatial incidence and severity
 - D. Guidelines for collecting samples
 - E. Guidelines for laboratory analysis
- IV. Grapevine Diseases
 - A. Viral diseases
 1. Leaf roll
 2. Red blotch
 3. Fan leaf degeneration
 4. Other viral diseases
 - B. Bacterial diseases
 1. Crown gall
 2. Pierce's disease
 3. Other bacterial diseases
 - C. Fungal diseases
 1. Armillaria root rot
 2. Verticillium wilt
 3. Phytophthora crown and root rot
 4. Blackfoot disease
 5. Bunch rots
 6. Botryosphaeria dieback
 7. Eutypa dieback

8. Downy mildew
9. Esca, black measles and petri disease
10. Phomopsis cane and leaf spot
11. Powdery mildew
12. Other fungal diseases

V. Insect and Mite Pests

A. Orthoptera

1. Grasshoppers
1. Katydid

B. Hemiptera

1. Aphids
2. Brown marmorated stink bug
3. Phylloxera
4. Western grape leafhopper
5. Variegated grape leafhopper
6. Virginia creeper leafhopper
7. Pseudococcus mealybugs (grape, obscure, longtailed)
8. Planococcus mealybug (vine)
9. Ferrisia (gill's)
10. Scale insects
11. Sharpshooter leafhoppers
12. Whiteflies

C. Thysanoptera

1. Thrips

D. Coleoptera

1. Grape bud beetle
2. Hoplia beetle
3. Branch and twig borer
4. Click beetle

E. Hymenoptera

1. Ants
2. Social wasps

F. Lepidoptera

1. Larvae found in grape clusters
2. Cutworms
3. European grapevine moth
4. Grape leaf folder
5. Light brown apple moth
6. Omnivorous leafroller
7. Orange tortrix
8. Western grapeleaf skeletonizer

G. Diptera

1. Drosophila
2. Acari
3. Grape erineum mite
4. Spider mites
5. Grape rust mite

H. Aranea

1. Black widow spiders

VI. Nematodes

- A. Root knot nematodes
- B. Dagger nematodes

- C. Ring nematode
- D. Pin nematode
- E. Citrus nematode
- VII. Vertebrate Pests
 - A. Mammals
 - B. Birds
- VIII. Vegetation Management
 - A. Vineyard floor management
 - B. Weed management
 - C. Special weed problems
- IX. Vectors
 - A. Sharpshooter / Pierce's Disease Complex
 - B. Xiphinema / Fanleaf Degeneration Complex
 - C. Mealybug / Leafroll Complex
 - D. Other potential vectors
- X. Beneficial Organisms
 - A. Insects
 - 1. Predators
 - 2. Parasitoids
 - B. Mites
 - C. Epiphytic microorganisms
 - D. Soil microorganisms
 - E. Vertebrates
- XI. Monitoring and Sampling
- XII. Pest and Disease Control Strategies
 - A. Integrated pest and disease management
 - B. Organic methods
 - C. Sustainable methods
 - D. Biodynamic methods
 - E. Biological control methods
 - F. Mechanical / physical control methods
 - G. Cultural control methods
 - H. Chemical control methods
 - 1. Principles and techniques of vine spraying
 - 2. Pesticide application and safety
 - 3. Chemigation
 - 4. Handling and use of pesticides
 - 5. Pesticide mode of action
 - 6. Pesticide resistance
 - a. Fungicide Resistance Action Committee (FRAC)
 - b. FRAC Number Relevance and Use
 - 7. Jurisdictional government agencies for pesticide approval, labeling, purchase and use
 - a. U.S. Environmental Protection Agency
 - b. California Environmental Protection Agency
 - c. California Department of Pesticide Regulation
 - d. Sonoma County Agricultural Commissioner
 - e. Licensing

Assignment:

1. Weekly reading (10-15 pages)
2. Weekly lab reports (1-2 pages)

3. Five field summary reports (1-2 pages)
4. Oral presentation on one disease and one pest, including life-cycle, symptoms and various control strategies
5. Exams: 5-6 quizzes, 1 midterm and 1 final exams
6. Vineyard calendar (showing timeline of pest/disease activity, critical monitoring and control)
7. Field work: identification of pests and disease symptoms on grapevines

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.

Weekly lab reports , field summary reports.	Writing 30 - 40%
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Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Field summary reports, Vineyard calendar	Problem solving 10 - 20%
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Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Field work: identification of pests and disease symptoms on grapevines	Skill Demonstrations 10 - 20%
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Exams: All forms of formal testing, other than skill performance exams.

Quizzes, Midterm, Final Exam	Exams 30 - 40%
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Other: Includes any assessment tools that do not logically fit into the above categories.

Oral presentation	Other Category 10 - 20%
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Representative Textbooks and Materials:

- Grape Pest Management - Third Edition, Larry J. Bettiga, Technical Editor, University of California Agricultural and Natural Resources Publication 3343, 2013 (classic).
- Vineyard Pest Identification and Monitoring Cards, Lucia Varela, et al. University of California Agricultural and Natural Resources Publication 3532, 2010 (classic)
- Field Guide to Diseases, Pests and Disorders of Grapes, P.A. Magarey et al. Winetitles Pty Ltd. , 2009 (classic)
- Instructor prepared materials