



Course Outline

2026-2027 Catalog

AGS 30 - Ecology of Insect and Disease Management

Catalog Description

Transfer Status: CSU

Unit(s): 3.00

Lecture: 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)

Lab: 51.00 Contact hours/0.00 Out of class hours/51.00 Total hours/1.00 Unit(s)

Total: 85.00 Contact hours/68.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

Course Description: A study of the scientific principles and concepts of ecologically based pest management, with emphasis on economically important insects and pathogens in agriculture, environmental horticulture, natural resources, parks and recreation. Included is an introduction to insects and disease organisms including their biology, ecology, identification and management with a focus on plants of the local geographic area.

Objectives

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

1. Explain the core concepts of integrated pest management (IPM) systems and the approaches to developing these systems.
2. Describe the characteristics of a "pest" including the reproductive strategies that make pests successful.
3. Analyze how politics influence pest control and pest management decision-making.
4. Identify the basic California pest management laws and regulations.
5. Describe basic entomology and plant pathology.
6. Identify commercially-important crop diseases and pathogens.
7. Identify commercially-important orders of insects which are pests and beneficials.
8. Plan and evaluate management strategies for insect and disease pests.
9. Analyze some of the common pest problems of agricultural and horticultural crops and their management with an emphasis on commercial agricultural practices in IPM.

Course Content

Topic Titles / Suggested Time Topic

Lecture

<u>Topics</u>	<u>Lec Hrs</u>
Pests and pest management	1.00
Introduction to insect evolution and ecology	2.00
Insect anatomy and physiology	2.00
Insect diversity and classification	3.00
Insect growth and development	1.00
Insect population dynamics	2.00
Non-chemical pest management methods	2.00
Pesticides	2.00
Biotechnological pest management methods	1.00
Introduction to plant diseases and pathogens	1.00
Fungi - biology, ecology, and management	3.00
Bacteria - biology, ecology, and management	2.00
Viruses - biology, ecology, and management	3.00
Management of plant diseases	2.00
Ecological principles of Integrated Pest Management (IPM) and the scientific method	3.00
Pest Management Guidelines and Year-round IPM Programs	2.00
California laws and regulations, labels, and the politics of pest management	2.00
Total Hours: 34.00	

Lab

<u>Topics</u>	<u>Lab Hrs</u>
Introduction to the scientific method	3.00
Insect anatomy	6.00
Introduction to and study of insect orders	6.00

Topics	Lab Hrs
Population dynamics and IPM laboratory	3.00
Sampling techniques of plant pathogens	4.00
Specimen collection field trips	6.00
Summarize various IPM systems through study, discussion, and presentation	6.00
Insect identification and collection curation	15.00
Introduction to collection methods	2.00
Total Hours: 51.00	

Methods of Instruction

- A. Discussion
- B. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- C. Instructor Demonstrations
- D. Lecture
- E. Multimedia Presentations

Methods of Evaluation

- A. Exams/Tests
- B. Quizzes
- C. Projects
- D. Class participation
- E. Mid-term and final examinations
- F. Laboratory evaluation will consist of problem solving exercises, an exam, written reports, and the completion of an insect collection.

Examples of Assignments

Reading Assignments

1. Read the chapter on insect mouthparts and complete the corresponding homework assignment provided online. Be prepared for an in-class discussion in small groups.
2. Read the chapter on disease transmission and complete the corresponding homework assignment listed online. Be prepared for an in-class discussion in small groups by pathogen or crop.

Writing Assignments

1. Write three (3) paragraphs detailing the abundance, characteristics and functions of the different classes of almond diseases during an in-class assessment.
2. Select a label of an agricultural pesticide, write a 300-word description of the PPE, REI, and PHI for a specified crop and pest from the label.

Out-of-Class Assignments

1. Complete an insect collection with a minimum of 30 distinct species. Both mature and immature specimens are allowed, and cite all required collection information. Include an identification sheet for all specimens.
2. Take home a diagram of an insect's mouthparts, label each structure, and then provide a brief description of the labeled structures. At the next class meeting, share your diagram in small groups.

Recommended Materials of Instruction

Borror, D.J. & White, R.E. (1998). Peterson Field Guide to Insects. *Houghton and Mifflin Co*, 1st. 9780395911716.

Flint, M.L. (2012). IPM in Practice: Principles and Methods of Integrated Pest Management. *University of California Agriculture and National Resources*, 2nd. 9781601077851.

Will, K., et al. (2020). Field Guide to California Insects. *University of California Press*, Second Edition. 9780520288744.

Aglaive, B. (2021). Handbook of Plant Disease Identification and Management. *CRC Press*, 1st. 9781138585478.

Other Learning Materials

Insect box and pins from instructor

Minimum Qualifications

Agricultural Production
Agriculture (Masters Required)

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