PEPS 463 MEDICAL & URBAN ENTOMOLOGY
HYBRID
FALL SYLLABUS

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Course website: https://cms.ctahr.hawaii.edu/peps463/

Office Hours (GIL 402): Tuesdays after lecture – 5 PM, or by appointment

COURSE SCHEDULE

Video = asynchronous video lecture - view at your own pace

	Topic/Subject
Video	Introduction of instructor and topics
8/25/2- (in-person)	Introduction; Mosquitoes, mosquito-borne diseases, and control
Video	Interesting ants around the world; ant species in Hawaii
Video	Ant prevention and management
9/8/2- (in-person)	Lecture/lab: hands-on experiments 1) follow the pheromone trail 2) alginate hydrogel ant bait
Video	Urban ecosystems and pest status – the concepts
Video	Guest lecture: Mosquito microbiome
9/22/2- (in-person)	Information literacy session with Science Librarian; integrating AI ethically into your writing (ChatGPT, Gemini, Perplexity, SciSpace)
Video	Termite life cycle and differences between ground termite vs. drywood termite
10/6/2- (in-person)	Termite management and advances; Bed bug biology and management
Links	Read 2 articles on the future of urban and medical entomology (links available on course website). Optional Extra Credit opportunity: submit a 2-page essay on future perspectives of termite management, *OR* a 2-page essay on future of urban and medical entomology
10/13/2- (in-person)	Biology and identification of cockroaches (with specimen observation)
Video	Fleas and flea-borne diseases: Plague and human history, murine typhus
Video	House flies, blow flies, flesh flies; Forensic entomology
10/27/2- (Zoom)	Guest lecture: *IPM from the perspective of a pest management company's manager*
Video	Horse flies, deer flies, tsetse flies: African sleeping sickness No-see-ums; sand flies: Leishmaniasis
	Reminder: 1-page title and outline due 10/31
11/10/2- (in person)	Delusional Parasitosis

Video	Lice and louse-borne diseases: Epidemic typhus, relapsing fever
Video	Ticks and tick-borne diseases: Lyme disease, tick paralysis, relapsing fever
11/17/2- (Zoom)	Guest lecture: *Invasive species research at University of Guam with the emphasis on Little Fire Ant management*
	Reminder: 10-page full mini-proposal due 11/20
11/24/2- (in person)	Class presentation
Video	Mites: Scrub typhus disease, allergies, scabies
Video	Stored-product insects
12/1/2- (Zoom)	Guest lecture: CTAHR Associate Dean of Research: *One-Health, Vectors, and Emerging Infectious Diseases: Modeling host range and geographic distribution*
	Reminder: 1-2 pages peer feedback due 12/2
Video	Fabric and paper pests
12/8/2- (in person)	Class presentation
	Reminder: Mini proposal revision due 12/9 (if required) Lab reports due
Video	Probit analysis
TBD	Challenges and future perspective
12/15/2-	Revision and Final exam

COURSE OVERVIEW

This 3-credit, hybrid course will explore the biology, identification, ecology, behavior, health and economic impacts, and control of urban and medically important insect pests.

The lectures are broken up by topics. The pre-recorded videos on the course website https://cms.ctahr.hawaii.edu/peps463/ vary in length of time and students can view them at their own pace.

The lectures will cover insects associated with homes and structures, such as termites, ants, cockroaches, and bed bugs. The lectures will also cover the role of insects and other arthropods, such as mosquitoes, flies, fleas, lice, and ticks, as vectors of diseases, impacts on human populations, clinical signs and symptoms of the diseases, disease epidemiology, and integrated approaches to management.

COURSE OBJECTIVES

Students will accomplish these following objectives:

1. Students will demonstrate knowledge on common vectors, insect borne diseases, and their associated symptoms.
2. Students will demonstrate knowledge on urban and medical pest biology, ecology, behavior, and their impact on human and animal health.
3. Students will accurately identify major groups or species of urban and medical insect pests.
4. Students will be able to design and apply appropriate concepts in pest prevention and management approaches.

STUDENT LEARNING OUTCOMES

The instructional program in *Plant and Environmental Protection Sciences (PEPS)* is structured to achieve the following student learning outcomes:

1. Students will demonstrate understanding of the biology, ecology, and impact of pest and beneficial organisms.
2. Students will demonstrate an understanding of the environment as a complex and changing system.
3. Students will be able to diagnose problems in environmental systems and develop management plans.
4. Students will be able to communicate (oral, written) effectively about plant and environmental protection.
5. Students will demonstrate the ability to collect, manage, present, and critically interpret data and information in an ethical way.

ASSESSMENT AND GRADING

As recommended by the University of Hawaii at Manoa, the +/- grading scale will be used.

A+ 97-100
A 93-96.99
A- 90-92.99
B+ 87-89.99
B 83-86.99
B- 80-82.99
C+ 77-79.99
C 73-76.99
C- 70-72.99
D+ 67-69.99
D 63-66.99
D- 60-62.99
F 0-59.99

READING MATERIALS

No required textbook ($0 textbook cost.). The material will be uploaded by instructor on the course website.

Suggested reference books:

1. Robinson, W.H. 2005. Urban Insects and Arachnids: A Handbook of Urban Entomology. Cambridge University Press. 472 pp.
2. Service, M.W. 2000. Medical Entomology for Students. Second Edition. Cambridge University Press. 283 pp.

COURSEWORK BREAKDOWN (*subject to changes*)

Mini-Proposal (40%)

- **Title & Outline (1 page):** due **Oct 31**. Student will receive feedback in 3 days (if there is any).
- **Draft (10 pages):** due **Nov 20**, following the required format below.
- **Peer Feedback (5%) (1–2 pages):** due **Dec 2**.
- **Final Revised Proposal (if needed):** due **Dec 9**.
- Late submissions will lose points.

Mini-Proposal Assignment Guidelines

1. Title & Outline Submission

- **Due: October 31**
- **Length:** 1 page
- **Content:**
  - Title of your proposed project
  - Outline of the proposal (main sections, key points you plan to cover)
- **Notes:**
  - Instructor will review and provide comments before approving your topic.
  - Your project must focus on the ***biology or management of urban pests or medically important insect pests***.
  - You must explain **why this project is relevant to *Hawaii***.

2. Full Mini-Proposal

- **Length:** ~10 pages
- **Due: Written full mini-proposal by November 20, Revision (if needed) by December 9**
- **Format Requirements:**
  1. **Introduction** (10 points) – Describe the pest/problem, background context on the species, etc.
  2. **Literature Review** (15 points) – Summarize existing research, identify knowledge gaps.
  3. **Justification** (10 points) – Explain why this project is needed in Hawaii.
  4. **Objectives/Hypotheses** (5 points) – Clearly state proposed research goals.
  5. **Methods/Experimental Design** (20 points) – Outline how the study would be conducted, how the data would be collected.
  6. **Expected Outcomes** (20 points) – What results might be expected?
  7. **Beneficiaries** (10 points)– Who will benefit from the project (e.g., homeowners, communities, public health, agriculture, tourism)?
  8. **References** (10 points) – Properly formatted following APA Reference Style.

Individual Proposal Presentation (15%) (~10 min):

Delivered in classes during November and December. Classmates will ask questions following presentations. Grading rubric will be provided and Q&A plays an important part in the grading.

Lab Reflections (2 total, 15%)

1. Write a 3-page lab reflection report.
2. Write a 3-page summary and reflection of a guest lecture by the CTAHR Associate Dean of Research on “One-Health, Vectors, and Emerging Infectious Diseases” from Dec 1st.

Final Exam (25%) – Dec 15

Written exam (essay format), covering in-person, online, and pre-recorded lectures, readings, and discussions.