**UNIVERSITY OF HAWAI‘I AT MĀNOA**
**UHM-1 FORM (ADD A COURSE)**

See Guidelines for instructions and deadlines. For undergraduate courses, submit an original and 4 copies; graduate courses, submit an original and 6 copies. If cross-listed, include extra copies for cross-listed department(s) & college(s). List one course per form. Attach additional sheets as needed.

<table>
<thead>
<tr>
<th>1. Course Subject</th>
<th>2. Course Number</th>
<th>3. Effective Term (semester &amp; year)</th>
<th>4. Frequency (check all that apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEPS</td>
<td>430</td>
<td>Spring/2012</td>
<td>Fall semester</td>
</tr>
</tbody>
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<thead>
<tr>
<th>5. Offering Status (check one)</th>
<th>6a. Full Course Title (Alpha courses: attach separate sheet &amp; specify title for each alpha)</th>
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<tbody>
<tr>
<td>Regular</td>
<td>Plant Disease Management</td>
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<tr>
<td>Experimental</td>
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<tr>
<td>Single-term</td>
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<thead>
<tr>
<th>6b. BANNER Course Title (30 characters max, including spaces/punctuation. Alpha courses: attach separate sheet &amp; specify title for each alpha)</th>
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<tbody>
<tr>
<td>PLANT DISEASE MANAGEMENT</td>
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<thead>
<tr>
<th>7. Grade Option (check all that apply)</th>
<th>8. Gen Ed Core or Hawaiian/Second Language Requirement Designation (check one)</th>
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</thead>
<tbody>
<tr>
<td>□ Letter Grade</td>
<td>□ Do not consider for Core or Hawaiian/Second Language designation.</td>
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<tr>
<td>□ Satisfactory/Unsatisfactory (500, 700, 705F, 800, 805C only)</td>
<td>□ Request approval of ________ Diversification (DA, DF, DL, DB, DP, DY, DS),</td>
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<tr>
<td>□ Credit/No Credit</td>
<td>Foundations (FW, FS, FG), or Hawaiian/Second Language (HSL) designation</td>
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<tr>
<td>□ Honors (Medicine only)</td>
<td>(For Foundations, also submit a proposal to General Education Office.)</td>
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<tr>
<th>9. Contact Hours (meeting hours per week – if variable, specify range)</th>
<th>10. # of credits (if variable, give range)</th>
<th>11. Repeat Limit</th>
<th>12. Credit Limit</th>
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<tbody>
<tr>
<td>6</td>
<td>4</td>
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<tbody>
<tr>
<td>□ Lecture (LEC)</td>
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<tr>
<td>□ Laboratory (LAB)</td>
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<tr>
<td>□ Discussion (DIS)</td>
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<tr>
<td>□ Seminar (SEM)</td>
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<td>□ Lecture/Discussion combined (LED)</td>
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<td>□ Lecture/Laboratory combined (LEL)</td>
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<td>□ Thesis/Dissertation (THE)</td>
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<tr>
<td>□ Field Experience/Internship/Practice (FIP)</td>
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<tr>
<th>17a. Prerequisite Course(s) (Use “and”, “ors” and punctuation to indicate relationships between prerequisites. “Or consent” is implied for ALL prerequisites. “Consent” requirements can be implemented through your class schedule each semester.)</th>
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<tbody>
<tr>
<td>NA</td>
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<tr>
<th>17b. Minimum required grade for prerequisites</th>
<th>17c. Blanket requirements listed in Catalog (if none, write “none”)</th>
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<tbody>
<tr>
<td>NA</td>
<td>none</td>
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<tr>
<th>17d. Non-introductory (NI) Course? (Numbered between 300 &amp; 499, or 200-level with college-level course as a prerequisite)</th>
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<tbody>
<tr>
<td>□ Yes</td>
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<tr>
<th>18. Catalog Description (Limit 35 words; 85 words for alpha courses)</th>
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<tbody>
<tr>
<td>Diagnosis, epidemiology, and integrated management of important plant diseases and pathogens for key plants and cultivated crops in various agroecosystems in Hawaii, the Pacific and the global tropics.</td>
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<tr>
<th>19. Justification</th>
<th>Attach separate sheets and indicate the rationale for the request, expected course enrollment, and a course syllabus.</th>
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<tr>
<th>20. Cross-listed or Honors Course(s)</th>
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<tr>
<td>Course Subject &amp; Number</td>
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<th>21. Requested By</th>
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<tr>
<td>PEPS</td>
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<td>Department/Unit</td>
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<tr>
<th>Approved By</th>
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<tr>
<td>1st College or School</td>
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<td>2nd College or School</td>
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<tr>
<th>General Education (Undergraduate courses)</th>
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<tr>
<td>Director</td>
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<tr>
<th>Graduate Division (600 level and above)</th>
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<td>Dean</td>
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<tr>
<th>Mānoa Chancellor’s Office</th>
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<tr>
<td>Vice Chancellor for Academic Affairs</td>
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Course justification and syllabus

PEPS 430 Syllabus (Spring 2012)
“Plant Disease Management”
Lecture: T-R 9:00-10:15
Lab: T 1:30-2:45; 3:00-4:15
Credits (4)

Instructor: Dr. Scot C. Nelson
Office: 402 Gilmore Hall, tel: 956-2000, email: snelson@hawaii.edu
Office hours: Monday 8-12 or by appointment

(From “Guidelines for Course Justifications”)

1. What is the course modification?
Not applicable.

2. Why is the course being requested?

Currently there is only a single course offered for plant pathology education in the PEPS undergraduate curriculum, an introductory course (PEPS 405, Plant Pathogens and Diseases). PEPS 405 does not offer in-depth education and training on the diagnosis, epidemiology and integrated management for the most significant plant diseases on the most economically and socially important crops in Hawaii and the tropics. Therefore, this new course is requested to fill this important gap in the PEPS curriculum.

The course is requested now because the instructor, Dr. Nelson, transferred from the UH-CTAHR Komohana Research and Extension Center in Hilo to be based at the Manoa campus. This provides students at the University of Hawaii at Manoa with a new opportunity to learn from Dr. Nelson’s valuable expertise, publications, photographs and data obtained from his 19 years of work experience for the University of Hawaii as a plant pathologist in Hawaii and the Pacific.

In addition, the training received in the proposed course on plant pathogens will supplement the training offered in an existing course for insect pest management (PEPS 421, Foundations of Pest Management). The PEPS students who take both courses will therefore receive a well-rounded and complete education on plant parasites and health problems in Hawaii and the tropics and prepare them sufficiently for immediate employment as plant health specialists or advisors.

Specifically, the justification for the course is that students will gain extensive laboratory and field experience and skills necessary for their future employment in plant health industries (for example, as plant health crop consultants) in the tropics. If the course proposal is not approved, the students will not be able to acquire sufficient knowledge and skills needed to serve as plant
health crop consultants in tropical agriculture or enter the plant health industry as fully capable employees.

3. How will the course content be organized?

See attached syllabus
See attached learning outcomes presented in syllabus

4. What other courses at UHM closely parallel the proposed course and in what way will the latter make a distinct contribution?

No other courses at UHM closely parallel the proposed course. No other courses provide in-depth training in the symptoms, occurrence, epidemiology, integrated management and consulting practices for the most important plant diseases in Hawaii, the Pacific and the tropics.

5. Where and how does the proposed course fit into the current and future curriculum?

The course serves as a keystone in the training and education of PEPS undergraduates in the practical and applied aspects of plant pathology. The course will provide information and skills regarding numerous significant real-life plant pathology problems experienced in Hawaii and tropical agriculture. The course will integrate and build significantly upon the knowledge and skills gained by students in PEPS 405 and PEPS 421, enabling them to deal with and communicate about plant health problems confidently and efficiently.

6. Why is the number of credits and level justified? Explain the prerequisites.

The number of credits (4) for the proposed course is justified by the weekly number of lecture minutes (150 minutes = 3 credit hours) plus weekly laboratory minutes (150 minutes = 1 credit hour). PEPS 405 is required as a prerequisite because the knowledge and skills gained by students in PEPS are needed as a foundation for the work done in the proposed course.

7. How will the course assist students to achieve the critical skills and competencies of CTAHR graduates?

The course will provide explicit training opportunities and assignments for students to develop and demonstrate competencies within each of the following CTAHR critical skills categories:

a. **Written communications.** Students will prepare written plant disease diagnostic and management reports based on their laboratory and library research activities. In these reports, students will use appropriate writing styles and write in a logical, grammatically correct manner.

b. **Oral communications.** Students will prepare well organized, oral plant disease diagnostic and management reports/presentations based on their laboratory and library research activities. In these reports/presentations, students will speak in a poised and confident
manner, utilize visual materials effectively, utilize appropriate speaking styles and listen to and answer questions about the presentations effectively.

c. **Analytical problem solving skills.** Students will identify and define an important tropical plant disease management problem. Based on their laboratory and library research, students will identify causes and possible solutions and select the best solutions to fit a given scenario. This work will demonstrate the scientific method of investigation.

d. **Personal characteristics.** Not addressed by this course.

e. **Human relations skills.** Students will work together effectively as teams to solve assigned problems in plant health management. Roles will be assigned or assumed by students within teams. In the process, students will demonstrate professional attitudes and specific group leadership skills. Students will demonstrate sensitivity to others, will avoid discriminatory behavior, and will demonstrate their self confidence and etiquette skills. Students will demonstrate ability to interact effectively with various sorts of agricultural clients (e.g., farmers) who will receive consulting advice and materials from the students.

f. **“Real world experience”**. Students will face real world plant disease management problems and have to develop understanding and effective solutions for the problems. In the process, students will learn to recognize career opportunities in the area of plant health management and consulting.

g. **Leadership skills.** Not addressed.

h. **Computer skills.** Students will use computers and software as research tools, to prepare reports and presentations, to communicate with clients, to record research data and keep records, and to publish an article or website on a plant disease management topic.

i. **Global perspective.** Students will learn to associate global geography with the likelihood of the occurrence of plant diseases and plant disease epidemics. Student will learn how plant disease management options vary according to global geography.

8. **How will students be evaluated?** Students will be evaluated by written and oral examinations, by their written and orally presented reports, by their work as team members in laboratory, by their completion of assignments, by their ability to isolate and culture plant pathogens, and by their oral participation in class.

9. **What are the minimum qualifications for teaching this course? Is a qualified instructor now available?** The instructor should have a Ph.D. in plant pathology with at least 5 years of experience in tropical plant pathology. An instructor is available (Dr. Scot C. Nelson).

10. **How will the course be financed, assuming no further cutbacks?** The course will be financed by normal departmental operating funds and operating funds from the research/
extension budget of the instructor. Donations from industry (testing materials, plant samples, funds) will also be sought to support the course.

11. Has the course been offered before? Is there a demand for it? The course has not been offered before. Dr. Janice Uchida, PEPS undergraduate program advisor, indicates that there is a demand for this course.

12. Is the course cross-listed with another department? The course is not cross-listed with another department.
PEPS 430 Syllabus (Spring 2012)

“Plant Disease Management”
Lecture: T-R 9:00-10:15
Lab: T 1:30-2:45; 3:00-4:15
Credits (4)
Instructor: Dr. Scot C. Nelson
Office: 402 Gilmore Hall, tel: 956-2000, email: snelson@hawaii.edu
Office hours: Monday 8-12 or by appointment

Plant Disease Management explores the diagnosis, epidemiology, and integrated management of important plant diseases for key crops growing in different cropping systems in Hawaii, the Pacific and the tropics.

Learning outcomes:

1. Students will learn how to diagnose and recognize the symptoms of more than 100 significant diseases of important tropical plants and crops.
2. Students will learn how to design and apply effective and integrated chemical and cultural plant disease management practices.
3. Students will learn how to develop integrated crop management portfolios.
4. Students will learn how to make oral and written presentations targeted for various clients and Internet delivery.
5. Students will learn the principles of plant disease epidemiology.
6. Students will learn how cropping systems and cropping practices affect the development of epidemics.
7. Students will learn advanced laboratory techniques for plant disease diagnosis.
8. Students will develop skills in the recognition of the key morphological attributes of important plant pathogens.
9. Students will learn to work effectively as team members in development of wiki pages to be published online regarding the diagnosis and management of an important plant disease.

Evaluation/grading:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Quizzes (10)</td>
<td>100</td>
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<tr>
<td>Midterm Exam</td>
<td>50</td>
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<tr>
<td>Assignments (2)</td>
<td>50</td>
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<tr>
<td>Laboratory</td>
<td>100</td>
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<tr>
<td>Attendance</td>
<td>10</td>
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<td>Participation</td>
<td>10</td>
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<tr>
<td>Final Exam</td>
<td>80</td>
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<td>TOTAL</td>
<td>400</td>
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The grade breakdown is: A = 360 and above; B = 320-359; C = 280-319; D = 240-279; F < 240. There will be two assignments: 1) Develop a written report for the diagnosis and management for an assigned plant health problem. Reports will be incorporated into an Internet Wiki page; 2) Develop an oral presentation about an important tropical plant disease, the biology and ecology of the pathogen(s) or causal agent, and management of the disease. Extra credit opportunities will be available (40 points). Cheating and plagiarism are not allowed.

Course schedule:

Week 1:
- Lecture (T) Introduction; Plant disease diagnosis; Pathogens and disease symptoms
- Lecture (R) Banana diseases and their management
- Lab (T) Introduction; Microscopy; Team formation; Semester Assignments, Internet resources; Black leaf streak of banana
- Reading: Black leaf streak of banana, Postharvest rots of banana, watch video ("Growing Bananas"), Checklist of Plant Diseases in Hawaii, Top crops and top diseases in Hawaii

Week 2:
- Lecture (T) Disease cycles; Pathogen life cycles; Principles of disease management
- Lecture (R) Coffee diseases and management
- Lab (T) Quiz #1; Cercospora leaf spot and berry blotch; Assignments
- Reading: Cercospora leaf spot and berry blotch; Coffee nematode decline, Collecting plant disease and insect pest samples for problem diagnosis

Week 3:
- Lecture (T) Measuring or estimating plant disease; disease assessment keys
- Lecture (R) Anthracnose of mango, papaya and avocado and management
- Lab (T) Quiz #2; Anthracnose (Colletotrichum gloeosporioides); Assignments
- Reading: Mango anthracnose; Anthracnose of avocado, Hawaii Host-Pathogen Database, Plant pathogen groups

Week 4:
- Lecture (T) Plant disease epidemiology
- Lecture (R) Phytophthora diseases and management: papaya, taro, noni, coconut, pineapple, cacao, tomato
- Lab (T) Quiz #3; Phytophthora; Assignments
- Reading: Black flag of noni; Phytophthora blight of papaya; Coconut heart rot, Late blight of tomato (Phytophthora infestans)

Week 5:
- Lecture (T) Plant disease management: advanced concepts
- Lecture (R) Powdery mildews: mango, plumeria, vegetables and management
- Lab (T) Quiz #4; Powdery mildews; Assignments
- Reading: Mango powdery mildew

Week 6:
- Lecture (T) Abiotic diseases; plant nutrition and disease
Lecture (R) Kava diseases: kava dieback, root knot, Pythium wilt, shot hole and management
Lab (T) Quiz #5; ELISA for Cucumber Mosaic Virus; Root-knot nematodes
Reading: Kava dieback; Root knot of noni, Glyphosate herbicide injury to coffee, Lightning injury to plants, Volcanic emissions injury to plant foliage

Week 7:
Lecture (T) Host plant resistance, GMOs for management of epidemics
Lecture (R) Rusts: Ohia/rose apple/Jaboticaba, lemongrass, blueberry, plumeria and management
Lab (T) Rusts; Assignments
Reading: Blueberry rust, rust of lemongrass, Plumeria rust

Week 8:
Lecture (T) Mid-term Examination
Lecture (R) Parasitic seed plants (Cassytha filiformis, dodders, Hawaiian mistletoes) and management
Lab (T) Quiz #6; Dodder, mistletoes, Cassytha; Assignments
Reading: Cassytha filiformis; Hawaiian mistletoes

Week 9:
Lecture (T) Vectors and their management for plant disease epidemics
Lecture (R) Virus diseases: banana bumpy top, papaya ringspot and management
Lab (T) Quiz #7; Aphids, Whiteflies, Thrips; Assignments
Reading: Banana bumpy top; Watch the bunchy top video, Papaya ringspot, Abutilon mosaic

Week 10:
Lecture (T) Hawaii Pesticide Information Retrieval System; Pesticide labels; Organic approaches to plant disease management/biological control
Lecture (R) Bacterial wilt of ginger, bacterial soft rot diseases and management
Lab (T) Quiz #8; Bacterial streaming; Erwinia; Pseudomonas/Acidovorax
Reading: Bacterial leaf blight of fishtail palm, Bacterial leaf blight of Aglaonema

Week 11:
Lecture (T) Cropping systems and integrated pest management
Lecture (R) Root rots: diagnosis and management (Pythium, Phytophthora, Rhizoctonia)
Lab (T) Quiz #9; Rhizoctonia, Pythium, Fusarium; Assignments
Reading: Cylindrocladium root rot of spathiphyllum, Integrated management of kava diseases

Week 12:
Lecture (T) Nursery diseases and management
Lecture (R) Landscape and garden diseases and management
Lab (T) Quiz #10; Blossom end rot; nutritional deficiencies, Manoa garden plots, Manoa campus (field trip)
Reading: Fairy rings; toadstools, stinkhorns and puffballs

Week 13:
Lecture (T) Forest diseases and management
Lecture (R) Diseases of native plants and management
Lab (T)
Reading: Rusts of Acacia koa; Rust of Abutilon menziesii; Koa wilt

Week 14:
Lecture (T) Watercress aster yellows, Dodonea yellows and management
Lecture (R) Sweetpotato diseases and management
Lab (T) Class presentations
Reading: Rhizopus rot of sweetpotato; Java black rot

Week 15:
Lecture (T) Palm diseases and management
Lecture (R) Maize diseases and management
Lab (T) Class presentations
Reading: Cephalurosporella; plant-parasitic green algae

Week 16:
Lecture (T) Interacting with various client groups: homeowners, Master Gardeners, commodity organizations, community organizations, government organizations
Lecture (R) Designing disease management programs for different types of clients
Lab (T) Class presentations
Reading: None

Week 17:
Review for final examination; Course evaluation

Class assignments:

There will be two class assignments: an individual assignment and a team assignment. Time in lab will be allotted to working on these assignments (library work, discussions).

1. Individual assignment: Prepare an oral presentation (PowerPoint) for a client group about an important tropical disease and it's management (40 points).

2. Team assignment: Develop a wiki page for an important plant disease in the tropics (the disease will be assigned to you) and the integrated management of the disease. The page will include text, photographs and references. The page will be published on the Internet (40 points).

Laboratory:

Laboratory work will include the following tasks.

1. Collection and preservation of plant samples for diagnostic work
2. Written descriptions of plant symptoms and associated edaphic information
3. Microscopic examination of symptomatic tissues, with drawings and written descriptions
4. Pathogen isolation and culture
5. Plant inoculations
6. Work on assignments
A lab notebook is required (20 points). Students will record their data and observations in the lab notebook. Plant inoculations will occur according to the availability of plants and pathogens. Students must complete at least one successful inoculation to fulfill Koch’s postulates.

**Reading assignments:**

All quizzes will be based on the following reading assignments.


Nelson, S., and Sewake, K. 2008. **Volcanic Emissions Injury to Plant Foliage**. University of Hawaii at Manoa, College of Tropical Agriculture and Human Resources, Cooperative Extension
Service, PD-47. 11 p.


Hawaii Pesticide Information Retrieval System