

**CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS
NEW CERTIFICATE PROGRAM PROPOSAL**

Must be submitted no later than October 15, 2014, and finalized by the end of the fall semester for the next catalog production. Refer to latest Senate Policy on Certificate Program Requirements: <http://senate.csuci.edu/policies/2010-2011/index.htm>

DATE: OCTOBER 15, 2014
HOST PROGRAM ARE: BIOLOGY

1. **Title:** Pest Control Adviser Certificate Program

2. **Objectives:** To meet the critical shortage of licensed Pest Control Advisers (PCA) in the region and California, *CI's Pest Control Adviser Certificate Program* would provide enrolled baccalaureate, recent graduates, and re-entry students with the academic preparation to qualify for the California's Department of Pesticide Regulation PCA licensing examination.

3. **Justification:** California's annual agricultural economy ranks first among all states, and if ranked separately, is the fifth largest in the world. In Ventura County, farming and farm-related businesses generate \$2.1 billion in revenue and \$76 million in indirect business taxes per year. One in ten county residents relies, to some extent, on income derived from crop production. Threats to the continuing viability of agriculture, such as those from plant pests and pathogens, are of serious concern and would have immediate and devastating impacts across the region. For example, the Asian citrus psyllid can transmit an incurable bacterial disease known as Huanglongbing (HLB) to citrus trees. The disease destroys the taste and appearance of citrus fruit, and infected trees die within a few years. In October 2012, the first breeding population of the Asian citrus psyllid was identified in Ventura County. HLB has not yet been reported in Ventura, but since its appearance in neighboring Los Angeles County in March 2012 the potential for introduction has increased significantly. All commercially valuable varieties of citrus are vulnerable. When HLB reaches Ventura County, and if it cannot be eradicated or controlled, the region may quickly lose its iconic \$210 million dollar citrus production industry, as well as its residential fruit trees.

California Pest Control Advisers (PCAs) play a critical role in the balance between agricultural pest management and the State's strict regulation of pesticide use. PCAs are licensed professional consultants who serve state agriculture and horticulture producers by providing crop production advice on pest management, as well as a host of additional plant health-related issues. A PCA is licensed by the State of California's Department of Pesticide Regulation to provide written recommendations on pesticide use, which must address environmental impact, worker safety, and a detailed plan for the use of chemical or biological pest control materials.

Although there are currently over 4000 licensed PCAs in the state, numbers are dwindling rapidly. A 2010 demographic survey conducted by the California Association of Pest Control Advisers its 3100 members revealed that 40 percent are over age 55, with only 21 percent under the age of 44. Fifty-three percent anticipate retirement within ten years. One reason for the diminishing labor pool may be relatively large number of units required to qualify for the state examination. Many of these specialized agriculture courses are not part of typical biological or natural sciences curricula. In addition, students at universities without agriculture programs are often unaware of pest control adviser as a career option.

Qualifications for taking the State's licensing include a B.A. or B.S. degree in agricultural sciences, biological sciences, natural sciences, or pest management, including 42 semester units in specific core courses, or 24 months agricultural work experience and the 42 core course units. Upon completion of the required course work, PCA applicants must pass a written examination prior to licensure.

Together with this certificate proposal, the Biology Program is submitting proposals for additional course in the crop health, pest management and production systems categories to meet the 42 unit requirement set by California's Department of Pesticide Regulation. Finally, the proposed certificate program is both adaptable and sustainable. Because courses will be offered through the Extended University, our program will be responsive to evolving trends and practices in agriculture and pest management, allowing us the flexibility to hire adjunct instructors with expertise in emerging fields as needed.

4. **Program Description:**

The Pest Control Adviser certificate program provides the 42 units of academic coursework necessary for students to qualify for the Pest Control Adviser examination offered by the California Department of Pesticide Regulation. Students earning a BA/BS in Biology can incorporate all but seven of these units as part of the lower and upper division requirements in the major or from required supporting courses in chemistry. The remaining units, Integrated Pest Management (BIOL 472) and Advanced Topics in Production Systems (BIOL 474), will be offered through Extended University's Special Sessions. **The Certificate shall be awarded through Extended University's Special Sessions.**

I. Certificate Requirements:

There are 42 semester units in four core areas: 1) 12 units of physical, biological, and natural sciences, 2) a minimum of nine units in crop health, 3) a minimum of six units in pest management systems and methods, and 4) a minimum of six units in production systems.

II. Prerequisites:

Earned degree or current enrollment in BA/BS in Biology. Some electives have prerequisites (see course descriptions). Non-matriculated students with the appropriate work experience will be admitted directly into the certificate program and may enroll with permission of instructor.

III. Program of Study:

In consultation with Certificate Program Advisor, select a total of 42 units from among the following:

A. ***Physical, Biological, and Natural Sciences***

Take a minimum of 12 units from among the following courses:

BIOL 200 - Principles of Organismal and Population Biology Units: 4

BIOL 201 - Principles of Cell and Molecular Biology Units: 4

BIOL 300 - Cell Biology Units: 4

BIOL 301 - Microbiology Units: 4

BIOL 302 - Genetics Units: 4

BIOL 303 - Evolutionary Biology Units: 3

CHEM 121 - General Chemistry I Units: 4
CHEM 122 - General Chemistry II Units: 4
CHEM 311 - Organic Chemistry I Units: 3
CHEM 312 - Organic Chemistry I Laboratory Units: 1
CHEM 314 - Organic Chemistry II Units: 3
CHEM 315 - Organic Chemistry II Laboratory Units: 1

B. Crop Health

Take a minimum of nine units from among the following courses:

BIOL 452 Entomology (4 units)
BIOL 470 Plant Pathology (4 units)
BIOL 471 Soils (4 units)

C. Pest Management Systems and Methods

Take a minimum of six units from among the following courses:

BIOL 472 Integrated Pest Management (4 units)
Required for the PCA Certificate
BIOL 473 Sustainable Agriculture (4 units)

D. Production Systems (minimum of 6 units)

Take a minimum of six units from among the following courses:

BIOL 474 Advanced Topics in Production Systems (3 units)
Repeatable by topic for a maximum of 6 units
CHEM 480 - Beer, Wine, and Spirits: The Art and Science of Fermentation (4 units)

E. Internship /Independent Research

*Up to 6 units of internship and/or independent research may be applied to the core areas of crop **health**, pest management systems and methods, or production systems with the permission of the Certificate Advisor.*

BIOL 492 Internship (1-3 units)
BIOL 494 Independent Research (1-3 units)

4b. New Courses:

BIOL 470 Plant Pathology (4 units)

Plant pathology is the science of plant diseases, the microorganisms that cause them, and their interactions. The objective of this course is to introduce students to the many plant pathogens, examples of the types of disease they cause, their fundamental biology, and the principles and concepts of their spread, and management. Agriculturally important diseases of crops will be discussed.

Prerequisite: BIOL 300

BIOL 471 Soils (4 units)

This course provides students with a fundamental understanding of the structure and function of soil systems: the kinds of organisms that inhabit soil, microbe-plant interactions, nutrient cycling, soil fertility, and plant production. Soil is a habitat for plant roots and plant symbionts, plant pathogens, bacteria and fungi, and macrofauna (i.e. earthworms and vertebrates). Understanding the belowground environment and its complexity is crucial for

understanding soil fertility and the role that soils play in agriculture, environmental quality and global environmental change.

Prerequisite: BIOL 201 and CHEM 122

BIOL 472 Integrated Pest Management (4 units)

Integrated pest management is a comprehensive approach to monitoring and controlling agricultural pest in an environmentally acceptable manner. The ecological principles of pest management will be presented and practiced as they relate to plant pathogens, weeds and arthropod pests. The major strategies for controlling pests, including the use of natural predators, cultural practices and chemical applications, will be discussed.

Students will also examine the current pest management practices of local agricultural systems. *Offered through Extended University.*

Prerequisite: BIOL 200

BIOL 473 Sustainable Agriculture (4 units)

This course will explore both local and global issues pertaining to sustainable agriculture. We will examine theoretical and practical aspects of food production from ecological, as well as social and economic perspectives. Topics will include soil fertility, crop selection, irrigation, pest management and sustainable food delivery systems. The laboratory will explore sustainable practices in a garden setting and in local agricultural systems. We will also discuss the challenges of food production in hotter and dryer condition stemming from climate change.

Prerequisite: BIOL 200

BIOL 474 Advanced Topics in Production Systems (3 units).

This course will cover new developments in agricultural production systems. Repeatable by topic for a maximum of 6 units. *Offered through Extended University.*

Prerequisite: Consent of Instructor

Certificate Advisor: Ruben Alarcón

5. **Fiscal Support Required:** The Biology Program recently received a \$10,000 gift from the Sence Foundation to develop this program. The Extended University will offer some courses through Special Sessions and will manage enrollment of non-matriculated students.
6. **Faculty Available to Teach:** Biology faculty.
7. **Procedure for awarding certificate:** Upon completion of the required courses students wanting a certificate shall bring their official transcripts to the Certificate Program Advisor. If the required courses have been completed with a C- or better the **Advisor** shall request a certificate be issued through the necessary channels.

Ruben Alarcón
Proposer of Certificate

October 12, 2014
Date

Certificate Approvals

The CI program review process includes a report from the respective department/program on its progress toward accessibility requirement compliance. By signing below, I acknowledge the importance of incorporating accessibility in course design.

Title of Certificate Program: Pest Control Adviser Certificate Program

Certificate Advisor

Date

Host Program Chair

Date

Curriculum Committee Chair

Date

AVP

Date

Provost

Date