COURSE OUTLINE

CROP PROTECTION
Course Title

AG219
Dept. & Course No.

I COURSE DESCRIPTION

This course provides the student with theoretical and practical skills in crop protection, including identification and control of insects, weeds, and pathogens. Emphasis in the course is on integrated management of main crop pests in the Pacific Islands through an understanding of the basic principles of agroecology.

II. SEMESTER CREDITS: 4

III. CONTACT HOURS PER WEEK: 3 Lecture | 1.5 Laboratory | 4.5 Total

IV. PREREQUISITE: AG214

V. STUDENT LEARNING OUTCOMES

At the end of the semester, the student will be able with at least 65% accuracy to:

1. Define crop protection and explain its importance to agriculture.
2. Explain the principles of crop protection.
3. Define agroecology and discuss the basic principles, concepts, and practices and explain the importance of agroecology in crop protection.
4. Discuss farm biodiversity and its role in pest and disease management.
5. Explain the concepts of integrated pest management and its relation to agroecology.
6. Identify and describe pests and evaluate their populations and damage to crops and human beings.
7. List and explain the choices of control measures for pests.

VI. COURSE CONTENT

A. Crop Protection
   1. Importance of Crop Protection
   2. Pests
   3. Plant Diseases
   4. Weeds

B. Principles of Crop Protection

C. Principles of Agroecology
   1. Closed Loop System
   2. Soil Health
   3. Micro-Climate Management
   4. Species & Genetic Diversification
   5. Microbiology

D. Biodiversity
   1. Types
   2. Ecosystem Services
   3. Diversification

E. Integrated Pest Management

F. An Overview To Pests
   1. Pests and Descriptions
   2. Pests and their Damages
   3. Pests in History

G. Pest Classification
   1. Vertebrates
   2. Invertebrates
      a. Pathogens
   3. Weeds

H. Control Measures
   1. Synthetic Chemicals
   2. Organic Pesticides
   3. Cultural Methods
   4. Biorations
   5. Mechanical and Physical
   6. Traps/Pheromones
   7. Use of Resistant Varieties

	8. Biological Methods
8. Identify common weed species and perform the methods of controlling them.	I. Weeds and Their Control 1. Growth Pattern 2. Use of Herbicides 3. Mulches 4. Biological Control
9. Identify and describe some of the insect pests of important root crops in the Pacific region and explain the preventive and control measures and identify the pest(s) responsible for specific type of damages to root crops.	J. Insect Pests of Root Crops 1. Cassava 2. Sweet Potato 3. Taro
10. Identify and describe some of the insect pests of important crops in the Pacific region and explain the preventive and control measures and identify the pest(s) responsible for specific type of damages to important crops.	K. Pests of Some Important Crops 1. Crucifers 2. Cucurbits 3. Legumes 4. Okra 5. Solanaceous Crops 6. Sugar cane
11. Identify and describe some of the insect pests of fruits and other trees in the Pacific Region and explain the preventive and control measures and identify the pest(s) responsible for specific type of damages to fruits and other trees.	L. Insect Pests of Fruits and Other Trees 1. Banana 5. Mango 2. Breadfruit 6. Papaya 3. Citrus 7. Pineapple 4. Coconut 8. Guava
12. Identify and describe common plant diseases in the Pacific region and their symptoms.	M. Plant Diseases
13. Apply the procedures of controlling plant diseases	N. Controlling Plant Diseases 1. Chemical control 2. Cultural control 3. Discouraging Plant Diseases Through Good Management 4. Biological Control
14. Perform the procedures of controlling rodents.	O. Controlling Rats and Mice
15. Name the major pesticide formulations and their application.	P. Pesticide Formulations 1. Sprays 2. Dusts 3. Aerosols 4. Fertilizer Combinations 5. Granular 6. Fumigants 7. Baits 8. Impregnating Materials
16. Demonstrate the safety procedures in applying pesticides.	Q. Pesticide Safety
17. Demonstrate proper use, handling, storage, and disposal of pesticides.	R. The Safe Handling and Storage of Pesticide
18. Describe the types and symptoms of pesticide poisoning and its first aid.	S. The Hazards of Pesticides 1. Poison on the Skin 2. Poison in Eye 3. Inhaled poisons 4. Swallowed Poisons 5. Chemical Burns in the Skin

VII EQUIPMENT AND MATERIALS:

1. Specimens
2. Compound and Dissecting Microscope
3. Prepared DVD's
4. Sprayers
5. Digital Camera
6. Pesticides
7. Standard Classroom Materials

VIII TEXTS

1. Del Rosario, Aurora, et.al. *Taro Production in Palau.* College of Micronesia Land Grant Programs, 2015.

2. Esguerra, Nelson M. and Aurora G. Del Rosario. *Economic Entomology in Micronesia.* Palau Community College, 2007.

IX METHOD OF INSTRUCTION

A. Lecture – Discussion
B. Demonstration
C. Laboratory Activities
D. Field Trips
E. Student Projects

X METHOD OF EVALUATION

LECTURE:

Participation	----------	05%
Quizzes	----------	15%
Midterm/Final Exam	----------	30%
Assignments	----------	10%

LABORATORY:

Participation	----------	15%
Laboratory Write-Ups	----------	10%
Project	----------	15%
TOTAL	----------	100%

Letter Grade Equivalent:

A	----------	90% - 100%
B	----------	80% - 89%
C	----------	70% - 79%
D	----------	65% - 69%
F	----------	0% - 64%

TASK LISTING SHEET

AG219 Crop Protection — Credits: 3 1.5 24

Course Number and Title — Lec Lab Total Lab hrs

Tasks	Hours
SLO # 7 1. Identify commercially available pesticides, herbicides, fungicides, rodenticides, and traps and pheromones in Palau. 2. Explain the purpose for each and the application rate for specific crops. 3. Demonstrate the production of organic bio-pesticides.	5
SLO # 9 1. Identify and describe some of the insect pests of important root crops in Palau. 2. Perform physical, chemical, and organic control measures of identified pests.	5
SLO # 10 1. Identify and describe some of the insect pests of important crops in Palau. 2. Perform physical, chemical, and organic control measures of identified pests.	5
SLO # 11 1. Identify and describe some of the insect pests of fruit trees in Palau. 2. Perform physical, chemical, and organic control measures of identified pests.	5
SLO # 12 and 13 1. Identify and describe common plant diseases in the Pacific region and their symptoms. 2. Apply the procedures of controlling plant diseases.	4
	24

*** Lab hours are subject to change as necessary.**

Palau Community College
AG219 Crop Protection
Course Learning Outcomes

During the course experience, the ***course learning outcomes*** (CLOs) will be assessed through the use of signature assignments. A rating scale will be used to determine the students' proficiency level of each CLO using specifically aligned assignments. The numerical ratings of 4, 3, 2 and 1 are not intended to represent the traditional school grading system of A, B, C, D and F. The descriptions associated with each of the numbers focus on the level of student performance for each of the course learning outcomes listed below.

Rating Scale:	**4**	**Outstanding**
	3	**Proficient**
	2	**Developing**
	1	**Emerging**

CLO # 1

Numerical Value	**Define agroecology and discuss the basic principles, concepts, and practices and explain the importance of agroecology in crop protection.**
4	Perform all the following tasks accurately • Accurately defines Agroecology and discuss its basic principles. • Accurately list and explain the practices of Agroecology and discuss how this practices enhance crop protection
3	Perform the task mentioned above but most with only minor mistakes
2	Perform the task mentioned above but most are inaccurate or incomplete
1	Unable to complete the task mentioned above

CLO # 2

Numerical Value	**Identify and describe some of the insect pests of important root crops in the Pacific region and explain the preventive and control measures.**
4	Perform all the following tasks accurately • Accurately identify and describe the major root crop pests in the Pacific region. • Accurately identify insect pest(s) based on root crop damage. • Accurately explain the chemical and natural methods for prevention and control.
3	Perform the task mentioned above but most with minor mistakes
2	Perform the task mentioned above but most are inaccurate or incomplete
1	Unable to complete the task mentioned above

CLO # 3

Numerical Value	**Identify and describe some of the insect pests of important crops in the Pacific region and explain the preventive and control measures.**
4	Perform all the following tasks accurately • Accurately identify and describe the major pests of important crops in the Pacific region. • Accurately identify insect pest(s) based on crop damage. • Accurately explain the chemical and natural methods for prevention and control.
3	Perform the task mentioned above but most with minor mistakes
2	Perform the task mentioned above but most are inaccurate or incomplete
1	Unable to complete the task mentioned above

CLO # 4

Numerical Value	**Identify and describe some of the insect pests of fruits and other trees in the Pacific region and explain the preventive and control measures.**
4	Perform all the following tasks accurately • Accurately identify and describe the major pests of fruits and other trees in the Pacific region. • Accurately identify insect pest(s) based on fruit and tree damage. • Accurately explain the chemical and natural methods for prevention and control.
3	Perform the task mentioned above but most with minor mistakes
2	Perform the task mentioned above but most are inaccurate or incomplete
1	Unable to complete the task mentioned above

CLO # 5

Numerical Value	**Explain the safety procedures in the use of synthetic chemicals including handling, storage, and disposal**
4	Perform all the following tasks accurately • Accurately explain the safety procedures for handling, storing, and disposing of synthetic chemicals. • Accurately describes the types and symptoms of pesticide poisoning and its first aid.
3	Perform the task mentioned above but most with minor mistakes
2	Perform the task mentioned above but most are inaccurate or incomplete
1	Unable to complete the task mentioned above