

## COURSE OUTLINE

PLANT SCIENCE

Course Title

AG124

Dept. & Course No.

### I. COURSE DESCRIPTION

This course introduces students to the basic principles of plant classification, structure, growth, reproduction, propagation, and utilization. The course emphasizes plant science from an agricultural standpoint, stressing its importance in everyday agriculture.

### II. SEMESTER CREDITS: 4

### III. CONTACT HOURS PER WEEK: 3 3 6

Lecture Lab Total

### IV. PRE-REQUISITE: AG 111

### V. STUDENT LEARNING OUTCOMES:

### VI. COURSE CONTENT

Upon completion of this course, the student will be able, with **65%** accuracy, to:

- |   |  |
|---|--|
| 1. Demonstrate an understanding of the trends and issues affecting plant science. | A. Trends, Issues, and Challenges in Plant Science   |
| 2. Explain the role of cultivated plants and the benefits derived from them.      | B. The Role of Cultivated Plants   |
| 3. Classify selected plants based on their uses.                                  | C. Classification of Plants  |
| 4. Identify the various structures of plants and state their functions.           | D. Plant Structures and Functions <ol style="list-style-type: none"><li>1. Roots</li><li>2. Stems</li><li>3. Leaves</li><li>4. Flowers</li><li>5. Fruits and Seeds</li></ol>   |
| 5. Describe the internal and external structures of higher plants.                | E. Structure of Higher Plants <ol style="list-style-type: none"><li>1. Morphology</li><li>2. Anatomy</li><li>3. Histology</li></ol>  |
| 6. Recognize definitions and measurements of plant growth and development.        | F. Vegetative and Reproductive Growth and Development <ol style="list-style-type: none"><li>1. Shoot and Root System</li><li>2. Shoot Growth Patterns</li><li>3. Root Growth Patterns</li><li>4. Reproductive Growth and Development</li></ol> |
| 7. Explain the factors that influence and affect plant growth and development.    | G. Climatic Factors Influencing Plant Growth and Development <ol style="list-style-type: none"><li>1. Temperature</li><li>2. Rainfall</li><li>3. Light</li><li>4. Air Movement</li></ol>   |

8. Explain the different plant responses to light stimuli

H. Light Stimuli and Responses

1. Photoperiodism
2. Phototropism
3. Photomorphogenesis

9. Explain the processes of photosynthesis and respiration

I. Photosynthesis and Respiration

1. The Carbon Cycle
2. The Calvin Cycle

10. Discuss the factors affecting the rate of photosynthesis in higher plants.

J. Factors Affecting the Rate of Photosynthesis in Higher Plants.

1. Light quality
2. Light intensity
3. Carbon dioxide concentration
4. Heat
5. Water availability
6. Plant development

11. Perform the different methods of plant propagation.

K. Plant Propagation

1. Sexual Propagation
2. Vegetative Propagation

12. Perform the different methods of land preparation.

L. Methods of Land Preparation

13. Demonstrate the systems of land conservation practices.

M. Soil Conservation

14. Identify the different mineral elements for plant nutrition.

N. Mineral Nutrition

1. Primary Nutrients
2. Secondary Nutrients
3. Micronutrients

15. Diagnose deficiency symptoms of minerals and recommend the right kind of fertilizer materials.

O. Mineral Deficiency Symptoms

## VII MATERIALS AND EQUIPMENT

- A. Vegetative and Reproductive Plant Parts
- B. Fertilizers
- C. Plant Growth Regulators
- D. Farm Tools and Equipment
- E. Compound and Dissecting Microscope
- F. Laboratory Tools and Equipment
- G. Digital Camera
- H. Overhead Projector
- I. Standard Classroom Materials

## VIII TEXT

- A. Text

McMahon, M.J., A.M. Kofranck, and V.E. Rubatzky. *Plant Science: Growth, Development, and Utilization of Cultivated Plants*. 5<sup>th</sup> ed. Pearson Education, 2011.

## IX METHOD OF INSTRUCTION

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

## X METHOD OF EVALUATION

The lecture portion of this course will account for 60% of the grade while the laboratory will provide the other 40%.

<u>Lecture</u>	% of Grade
Participation	05%
Quizzes	15%
Tests	30%
Assignments	10%

<u>Laboratory</u>	
Participation	15%
Laboratory Write-Ups	10%
Projects	15%
TOTAL	100%

The computation of the letter grade is as follows:

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

## TASK LISTING SHEET

AG124 Plant Science  
Course title

Credits: 3 1 48  
Lec Lab Total Lab Hours

Tasks	Hours
SLO #3	
1. Fieldtrip to different farms to identify and classify common crops based on their economic uses.	3
SLO #4-5	
1. Collect dicot and monocot plant specimens and identify the various external structures and state their functions.	6
2. With the aid of a microscope, locate and identify the internal structures of a plant and state their functions.	
SLO #6-8	
1. Proceed to the AG farm and observe the crops and list down different changes of growth and development influenced by the environment.	12
2. Grow plants in the nursery and make observations on the effects of controlled environment to crops.	
3. From the growing plants, collect data on the crop responses to light stimuli. Record also the climatic influences to crops and be able to discuss each.	
SLO # 11	
1. Demonstrate the proper skills in sexual and vegetative plant propagations.	9
SLO #12-13	
1. In the farm, perform the appropriate method of land preparation suitable to certain topography	9
SLO #14-15	
1. With the crops grown in the farm, make accurate diagnosis on the different mineral deficiency symptoms and apply the right kind and amount of fertilizer materials to crops.	9
TOTAL LAB HOURS	<hr/> 48 hrs

\* Lab hours are subject to change as necessary.



**Palau Community College**  
**AG124 Plant Science**  
**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.

<b>Rating Scale:</b>	<b>4</b>	<b>Outstanding</b>
	<b>3</b>	<b>Proficient</b>
	<b>2</b>	<b>Developing</b>
	<b>1</b>	<b>Emerging</b>

**CLO # 1**

Numerical Value	Identify the various structures of plants and state their functions
<b>4</b>	Perform all the following tasks accurately <ul style="list-style-type: none"> <li>• Correctly identify the various structures of plants</li> <li>• Correctly state the functions of the different structures of plants</li> </ul>
<b>3</b>	Perform the task mentioned above but most with only minor mistakes
<b>2</b>	Perform the task mentioned above but most are inaccurate or incomplete
<b>1</b>	Unable to complete the task mentioned above

**CLO # 2**

Numerical Value	Explain the factors that influence and affect plant growth and development
<b>4</b>	Perform all the following tasks accurately <ul style="list-style-type: none"> <li>• Accurately explain the factors that influence and affect plant growth and development</li> </ul>
<b>3</b>	Perform the task mentioned above but most with minor mistakes
<b>2</b>	Perform the task mentioned above but most are inaccurate or incomplete
<b>1</b>	Unable to complete the task mentioned above

**CLO # 3**

Numerical Value	Perform the different methods of plant propagation
<b>4</b>	Perform all the following tasks accurately <ul style="list-style-type: none"> <li>• Accurately demonstrate the proper procedures for seed sowing</li> <li>• Accurately demonstrate the proper procedures for cuttings</li> <li>• Accurately demonstrate the proper procedures for grafting</li> <li>• Accurately demonstrate the proper procedures for air layering</li> </ul>
<b>3</b>	Perform the task mentioned above but most with minor mistakes
<b>2</b>	Perform the task mentioned above but most are inaccurate or incomplete
<b>1</b>	Unable to complete the task mentioned above

**CLO # 4**

Numerical Value	Demonstrate the systems of land conservation practices.
4	Perform all the following tasks accurately <ul style="list-style-type: none"><li>• Demonstrate the proper procedures in the use of cover crops and mulch</li><li>• Demonstrate the proper procedures in tilling</li></ul>
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	Diagnose deficiency symptoms of minerals and recommend the right kind and amount of fertilizer materials
4	Perform all the following tasks accurately <ul style="list-style-type: none"><li>• Correctly diagnose a nutrient deficiency symptom</li><li>• Correctly identify what inorganic or organic fertilizer to apply</li><li>• Correctly calculate the amount of fertilizer to use</li></ul>
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