

**Lead City University, Ibadan.**

**Faculty of Sciences.**

**Department of Microbiology.**

**2<sup>nd</sup> SEMESTER, 2017/2018 SESSION**

**COURSE TITLE: INTRODUCTION TO PLANT DISEASE.**

**COURSE CODE: BOT 311.**

**LECTURER IN CHARGE: Prof. ALLAN FEMI LANA & BAMKEFA, B.A (Dr.).**

**SECTION A:**

**INTRODUCTION:** This is an introductory course aimed at preparing students to understand the impact of plant diseases on social, financial and environmental activities. Plant pathology is defined as the study of the organisms and environmental conditions that cause disease in plants, the mechanisms by which this occurs, the interactions between these causal agents and the plant ( effects on plant growth, yield and quality), and the methods of managing or controlling plant disease including concepts of Integrated Post Management (IPM) . It also interfaces knowledge from other scientific fields such as mycology, microbiology, virology, biochemistry, etc. The course will (subject to availability of time and equipments) cover the practical aspects of plant disease identification.

**COURSE OBJECTIVES:** At the end of the course, the students should be able to:

- (i) describe the host – penetration and colonisation by pathogens;
- (ii) describe and explain the pre and post-penetration interactions of the host-pathogen and the environment;
- (iii) describe and explain the various methods of disease control and management.

**COURSE CONTENTS:**

- \* Introduction; Concepts: Plants Pathology, Pathogens, Pathogenecity, Etiology and Epidemics
- \* Host penetration colonization;
- \* Pre and post-penetration interaction between the host, pathogen and the environment;
- \* Methods of disease control and management.
- \* Integrated Pest Management (IPM)

**LECTURE SCHEDULE:**

**1ST-2<sup>ND</sup> WEEK:** Introduction;

**3<sup>RD</sup>-4<sup>TH</sup> WEEK:** Host-penetration colonisation;

**5<sup>TH</sup>-6<sup>TH</sup> WEEK:** Pre and post-penetration interaction of the host-pathogen and environment;

**7<sup>TH</sup> WEEK:** Mid-semester Test.

**8<sup>TH</sup> - 9<sup>TH</sup> WEEK:** Pre and post-penetration interaction of the host-pathogen and environment continued;

**10<sup>TH</sup> -11<sup>TH</sup> WEEK:**Methods of disease control and management;

**12<sup>TH</sup>- 13<sup>TH</sup> WEEK:** Methods of disease control and management continued;

**14<sup>TH</sup>-15<sup>TH</sup> WEEK:** - Revision;

-Tutorials.

**READING LIST:** An Introduction to plant pathology and plant disease management; by Gary D.Franc. University of Wyoming.1998.

-Plant pathology; published by the e-Resource unit; University of Sydney.2003.

-Plant Pathology: Agrios, 5<sup>th</sup> Edition 2012 Academic Press New York

**ASSESSMENT:** Continuous Assessment -30 marks; Examination- 70 marks.

**Akin Ogunleye**

**Prof. Allan Femi Lana**

**Instructors**

## SECTION B:

### TUTORIAL QUESTIONS.

**INSTRUCTION:** ILLUSTRATE YOUR ANSWERS WITH LARGE, CAREFULLY LABELLED DIAGRAMS AND DRAWINGS, WHERE APPROPRIATE.

1. (a) What is meant by 'disease – pyramid'. Explain.  
(b) Define the following: (i) Hemibiotroph; (ii) Necrotroph (iii) Hypotrophy ;  
(iv) Facultative - parasite.
2. (a) Using specific examples where necessary write briefly on the importance of receptor sites in the process of establishment of disease in plants.  
(b) Classify symptoms of plant diseases using various examples.
3. Enumerate and discuss ways of controlling plant diseases.
4. Describe the environmental factors that affect disease development.
5. (a) How will you classify diseases on the basis of their extent of occurrence and geographic distribution.  
(b) Name the disease caused by *Phytophthora infestans* and describe the symptoms, disease cycle and control measures of this disease.
6. Write short notes on: (a) Smut diseases and their control;  
(b) Mechanism of pathological wilting in plants;  
(c) Wart disease of potato.
7. (a) Write the name of one plant disease each caused by fungus, virus and bacteria and method of their control .  
(b) Differentiate between: (i) Rust and smut; (ii) Primary and Secondary host; (iii) Disease and Pathogen .
8. (a) Write short notes on: (i) Necrosis; (ii) Hyperplasia; (iii) Soil-borne diseases.  
(b) Explain the three phases of the infection process in plants.
9. List and explain FIVE cultural disease management practices.
10. (a) Write the name of the causative pathogen of the following diseases:  
(i) Citrus Canker; (ii) Loose smut; (iii) Late blight of potato.

- (b)i. What are the basic approaches to diagnosis of plant diseases.
- ii. Describe FIVE pathological effects of infection in plants.
11. Discuss the host factors that affect disease development.
12. a(i) What is meant by biological control of plant diseases?
- (ii) Highlight the mechanisms by which biological control agents work .
- (b) Discuss the chemical control of plant diseases. (c) Give examples of chemicals used in the control of plant diseases.
13. What is a pest? Give five examples of pest.
- b. What is Integrated Pest Management?
14. Discuss is the difference between Integrated Pest Management, cultural control Biological Control and Chemical Control of plant diseases.
15. What is the difference between a disease triangle and a disease pyramid?
16. Write a full essay on Integrated Pest Management.

## SECTION C:

### MARKING GUIDE.

1. (a) What is meant by 'disease – pyramid'. Explain.  
(b) Define the following: (i) Hemibiotroph; (ii) Necrotroph (iii) Hypotrophy ;  
(iv) Facultative - parasite. 17 ½ marks
2. (a) The importance of receptor sites in the process of establishment of disease in plants.  
(10 marks).  
(b) Symptoms of plant diseases with examples. (7 ½ marks)
3. Enumeration of ways of controlling plant diseases. (17½ marks).
4. Description of the environmental factors that affect disease development. (17½ marks)
5. (a) Classification of diseases on the basis of their extent of occurrence and geographic distribution. (6 marks).  
(b) The disease caused by *Phytophthora infestans*. (1½ mark)  
Description of the symptoms, disease cycle and control measures of this disease. (10 marks)
6. Short notes on: (a) Smut diseases and their control; (5 marks)  
(b) Mechanism of pathological wilting in plants; (7 ½ marks)  
(c) Wart disease of potato. (5 marks)
7. (a) The name of one plant disease each caused by fungus, virus and bacteria and method of their control. (8 ½ marks)

- (b) Differentiation between: (i) Rust and smut; (ii) Primary and Secondary host; (iii) Disease and Pathogen. (9 marks).
8. (a) Short notes on: (i) Necrosis; (ii) Hyperplasia; (iii) Soil-borne diseases. (6 marks).
- (b) Explanation of the three phases of the infection process in plants. (11 ½ marks).
9. List and explanation of FIVE cultural disease management practices. (17 ½ marks).
10. (a) Name of the causative pathogen of the following diseases:
- (i) Citrus Canker; (ii) Loose smut; (iii) Late blight of potato. (3 marks)
- (b) i. The basic approaches to diagnosis of plant diseases. (9 ½ marks)
- ii. Description of FIVE pathological effects of infection in plants. (5 marks)
11. Discussion of the host factors that affect disease development. (17 ½ marks)
12. a(i) What is meant by biological control of plant diseases? (1 ½ mark).
- (ii) Highlight and explanation of the mechanisms by which biological control agents work. (7 marks).
- (b) Discuss the chemical control of plant diseases. (5 marks)
- (c) Give examples of chemicals use in the control of plant diseases. (4 marks)