



LEAD CITY UNIVERSITY, IBADAN
Faculty of Sciences
Department of Microbiology

COURSE PARTICULARS:

Course code: BOT 411
Course title: Host-pathogen relations and plant disease management .
No. of Units: 3
Status: Elective

LECTURER DETAILS:

Name: Prof. Allan Femi LANA.
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Area of Specialization: Plant Virology; Plant Pathology.

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COURSE DESCRIPTION:

The course is about host penetration and colonization by pathogens; mechanism of damage and resistance by plants and general method of disease control and management.

COURSE OBJECTIVE:

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 mechanisms of damage and resistance;
- (iv) describe and explain the various methods of disease control and management.

ASSESSMENT:

Class Attendance	5marks
Test(s) and Assignments	35marks
Final Examination	60marks

LECTURE PLAN:

Week	Topic.
1st-2nd week	Introduction; Host-penetration and colonisation;
3rd-4th week	Pre and post-penetration interaction of the host-pathogen and environment;
5th-6th week	Mechanisms of damage and resistance;
7th-8th week	Mid-semester Test..
9th-10th week	Mechanisms of damage and resistance continued;
11th-12th week	Methods of disease control and management;
13th-14th week	Revision;
15th week	-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 by Agrios, G.N. 5th edition. Academic press New York.

Tutorial Questions:

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

SECTION I.

1.(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.

2.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.

3(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.

4(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.

5. (a) Write short notes on: (i) Necrosis; (ii) Hyperplasia; (iii) Soil-borne diseases.

(b) Explain the three phases of the infection process in plants.

6.(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 .

7. Enumerate and discuss ways of controlling plant diseases.

8. What are some common symptoms of diseases caused by biotic pathogens that cause changes in the amount or the balance of growth regulators in plants?

9. Discuss the factors that affect disease development.

SECTION II.

10. Discuss five examples of chemical weapons of attack produced by plant pathogens.

11. Differentiate between the following:

- (i) Polygenic and monogenic resistance;
- (ii) Toxins and enzymes;
- (iii) Tolerance and immunity;
- (iv) Penetration- peg and stylet;
- (v) Tyloses and necrosis.

12. How do pathogens attack plants?

13. How do plant hosts defend themselves against attack by pathogens? OR What weapon can a plant(plants) use to defend attack by plant pathogens?

14. What is Integrated Pest Management in plant disease management control?

15. List and explain FIVE cultural practices or principles of plant disease control.

MARKING GUIDE:

SECTION I.

1.(a) The 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).

2. a(i) The meaning of biological control of plant diseases? (2 marks).

(ii) Highlight and explanation of the mechanisms by which biological control agents work. (5 ½ marks) .

(b) Discussion of the chemical control of plant diseases. (6 marks)

(c) Examples of chemicals use in the control of plant diseases.(4 marks)

3 .(a) Classification of diseases on the basis of their extent of occurrence and geographic distribution. (8 marks).

(b) The disease caused by *Phytophthora infestans*. (1 mark)

Description of the symptoms, disease cycle and control measures of this disease.(8 ½ marks).

4(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)

5.(a) Short notes on: (i) Necrosis; (ii) Hyperplasia; (iii) Soil-borne diseases. (9 marks).

(b) Explanation of the three phases of the infection process in plants. (8 ½ marks).

6.(a) The name of one plant disease each caused by fungus, virus and bacteria and method of their control . (8 marks)

(b) Differentiation between: (i) Rust and smut; (ii) Primary and Secondary host; (iii) Disease and Pathogen .(9 ½ marks).

7. Enumeration of ways of controlling plant diseases. (17 ½ marks).

8. Some common symptoms of diseases caused by biotic pathogens that cause changes in the amount or the balance of growth regulators in plants? (17½ marks)

9. Discussion of the factors that affect disease development. (17 ½ marks)

SECTION II.

10. Discussion of five examples of chemical weapons of attack produced by plant pathogens.

11. Differentiation between the following:

- (i) Polygenic and monogenic resistance;
- (ii) Toxins and enzymes;
- (iii) Tolerance and immunity;
- (iv) Penetration- peg and stylet;
- (v) Tyloses and necrosis. 17 ½ marks.

12. How pathogens attack plants 17 ½ marks.

13. How plant hosts defend themselves against attack by pathogens OR Weapons a plant(plants) use to defend attack by plant pathogens? 17 ½ marks

14. Integrated Pest Management in plant disease management control ? 17 ½ marks.

15. List and explanation of FIVE cultural practices or principles of plant disease control. 17 ½ marks.