

## Syllabus for B.Sc. (Hons) Agriculture Year – I (Sem. II)

**Subject Code:** 16AS0214

**Subject Short Name:** Pl. Path. 2.1

**Subject Name:** Fundamentals of Plant Pathology

### Objective:

1. To get acquainted with the role of different microorganisms in the development of plant disease
2. To get general concepts and classification of plant diseases
3. To get knowledge of general characteristics of fungi, bacteria, virus, and other microorganisms causing plant diseases
4. To acquaint the students with reproduction in fungi, and bacteria, causing plant diseases
5. To get acquainted with various plant disease management principles and practices

**Credits Earned:** 3 Credits (2+1)

**Course Outcomes:** After completion of this course, Students will be able to

- Identify the plant diseases caused by various disease organisms.
- Isolate the various disease organisms in the laboratory.
- Know about mechanism of disease development in plant.
- Learn about pathogens survival, transmission and multiplication.

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	Mid Sem (M)	Progressive Assessment (PA)	Viva (V)	Term work (TW)	
2	0	2	3	40	20	20	10	10	100

### Theory Content:

Unit	Topics	Contact Hours
1	Introduction to Plant Pathology: Concept of disease in plants	2
2	Different terms used in Plant Pathology	1

3	History of Plant Pathology with special references to India	1
4	Causes of plant disease: Inanimate and animate causes, Classification of plant disease; Parasitism and pathogenesis	2
5	Development of disease in plants: Disease Triangle, Disease cycle	2
6	Fungi and their morphology reproduction	2
7	Reproduction of fungi	2
8	classification of fungi	2
9	Morphology, reproduction classification of phytopathogenic bacteria	2
10	Other plant pathogens: Mollicutes; Flagellant protozoa; FVB; Green algae and parasitic higher plants	2
11	Viruses and viroids, virus transmission	2
12	Principles of Plant disease management	2
13	Disease management with chemicals, Host resistance, cultural and biological method of Integrated Disease Management (IDM).	2
	<b>Total</b>	<b>24</b>

### Practical Content:

Unit	Topics	Contact Hours
1	Study of the microscope	2
2	Acquaintance with laboratory material and equipment	2
3	Microscopic examination of general structure of fungi	2
4	Simple staining of bacteria: Direct and indirect staining, Gram staining of bacteria	2
5	Microscopic examination of fungal diseased specimen	2
6	Microscopic examination of bacterial diseased specimen	2
7	Preparation of culture media, Isolation of plant pathogens	2
8	Study on plant disease diagnosis: Koch's Postulates	2
9	Characteristics & formulation of fungicides	2
10	Methods of application and calculation on fungicides	2
	<b>Total</b>	<b>20</b>

### Reference Books:

- Agrios, G.N. 2010. Plant Pathology. Acad. Press.
- Alexopoulos, Mims and Blackwel. Introductory Mycology.
- Dhingra, O.D. and Sinclair, J.B. 1986. Basic Plant Pathology Methods. CRC Press, London, Tokyo.
- Gibbs, A. and Harrison, B. 1976. Plant Virology - The Principles. Edward Arnold, London.
- Goto, M. 1990. Fundamentals of Plant Bacteriology. Academic Press, New York.
- Hull R. 2002. Mathew's Plant Virology. 4th edn. Academic Press, New York.
- Kamat, M. N. Introductory Plant Pathology.
- Prakash Pub, Jaipur. Mehrotra, R.S. and Aggarwal, A. 2007. Plant Pathology. 7th edn. Tata Mc Graw Hill Publ. Co. Ltd.
- Nene, Y.L. and Thapliyal, P.N. 1993. Fungicides in Plant Disease Control. 3rd Ed. Oxford & IBH, New Delhi.
- Pathak, V. N. Essentials of Plant Pathology. Prakash Pub., Jaipur
- Rajeev, K. and Mukherjee, R.C. 1996. Role of Plant Quarantine in IPM. Aditya Books.
- Rhower, G.G. 1991. Regulatory Plant Pest Management. In: Handbook of Pest Management in Agriculture. 2nd edn. Vol. II. (Ed. David Pimental). CRC Press.
- Singh R.S. 2008. Plant Diseases. 8 th Ed. Oxford & IBH. Pub. Co.
- Singh R.S. 2013. Introduction to Principles of Plant Pathology. Oxford and IBH Pub. Co.
- Verma, J.P. 1998. The Bacteria. Malhotra Publ. House, New Delhi.
- Vyas SC. 1993. Handbook of Systemic Fungicides. Vols. I-III. Tata McGraw Hill, New Delhi.

### Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
25%	25%	20%	10%	10%	10%

**Instructional Method:**

1. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by white board may also use any of tools such as demonstration, role play, quiz, brain storming, MOOCs etc.
2. The internal evaluation will be done on the basis of continuous evaluation of students in the class-rooms.
3. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory/ field.
4. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.