

COURSES OFFERED BY DEPARTMENT OF BOTANY
Category III:

**B.Sc. programme in Applied Life Sciences with Agrochemicals and Pest
Management**

DISCIPLINE SPECIFIC CORE COURSE (DSC 04)

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the core course			Eligibility criteria	Pre-requisite of the course (If any)
		Lecture	Tutorial	Practical/ Practice		
Plant Pathology ALS BOT DSC 04	4	2	0	2	Class XII pass with Biology/ Biotechnology	NIL

Learning Objectives:

The learning objectives of this course are as follows:

- to introduce students with various fungi, fungus like organisms, bacteria and viruses.
- to give an understanding of their characteristics, reproduction and ecology.
- to introduce students with the principles and concepts of plant pathology.
- to acquaint with various plant diseases, symptomatology, causal organisms and their control measures.

Learning Outcomes:

By studying this course, students will be able to:

- understand the world of different types of pathogens of plants.
- identify the characteristic symptoms of different groups of plant pathogens in the fields.
- understand the ecological and economical impact of plant diseases.
- identify common plant diseases and their control measures.
- understand the application and significance of integrated disease management.
- explicate the economic and pathological importance of fungi, bacteria and viruses.

Unit 1: Introduction

3 Hours

Definition, Concepts and Terminology; General symptoms; Classification of diseases.

Unit 2: Key events of Disease development**6 Hours**

Disease cycle; Host pathogen relationships; Plant defence mechanism (Structural and biochemical); Epidemiology and Disease forecasting.

Unit 3: Fungal Diseases**5 Hours**

General symptoms; Disease cycle and Control measures - Powdery mildew of Pea. Black stem Rust of Wheat; Smut of Barley (Loose and Covered smut).

Unit 4: Diseases caused by Oomycota**3 Hours**

General symptoms; Disease cycle and Control measures – White rust of Crucifers; Late blight of Potato.

Unit 5: Bacterial Diseases**3 Hours**

General symptoms; Disease cycle and Control measures - Citrus canker; Angular leaf spot of Cotton.

Unit 6: Viral Diseases**3 Hours**

General symptoms; Mode of transmission and Control measures-- Tobacco mosaic disease; Vein clearing of Bhindi.

Unit 7: Plant Disease Control**7 Hours**

Quarantine, Cultural practices, Physical methods, Chemical methods, Biological control (Antibiosis, Hyper-parasitism, Predation, Induced Systemic Resistance).

Practicals**60 Hours**

1. Study of White rust of crucifers, Symptoms on leaves and hypertrophy with the help of live or preserved specimens. Study of causal organism (*Albugocandida*) with the help of temporary tease/section mount. Permanent section mount of somatic and reproductive phases.
2. Study of Late blight of Potato through specimens, temporary mounts (V.S. of leaf showing infection) and permanent slides.
3. Study of Powdery mildew of Pea, Symptoms on leaves and stem of Pea with the help of live or preserved specimens. Study of *Erysiphe* asexual stage with the help of temporary tease/ section mount and sexual stage through permanent slides.
4. Study of Black stem Rust of Wheat, Symptoms on both Wheat and Barberry with the help of live or preserved specimens/photographs. Study of *Puccinia graministritici* with the help of temporary tease/section mount of Wheat . Permanent slides of somatic and reproductive phases on both the hosts.
5. Study of Smut of Barley, Symptoms of Loose and Covered smut through live or preserved specimens. Study of teliospores through temporary mount.
6. Study of Bacterial Diseases through the specimens - Citrus canker; Angular leaf spot of Cotton.

7. Study of Viral Diseases through specimens - Tobacco mosaic Disease; Vein clearing of Bhindi.
8. Study of Phylloplane Mycoflora through cellotape method.
9. Study through digital images / photographs – Chlorosis, Tuber rot, Apple scab, Mycoparasite, Predaceous fungi.

Essential/ Recommended readings:

1. Singh, R.S. (2021). Plant Diseases 10th revised edition, Medtech, New Delhi.
2. Schumann, G.L. and D'Arcy C.J. (2009). Essential Plant Pathology 2nd edition, American Phytopathological Society, U.S.A.
3. Agrios, G.N. (2005). Plant Pathology 5th edition, Elsevier Academic Press, Amsterdam.
4. Oliver, R. (2023). Agrios' Plant Pathology 6th edition, Academic Press.
5. Sharma, P.D. (2014). Plant Pathology Rastogi Publications, Meerut, U.P.

Suggestive readings:

1. Gupta, R. and Chugh, G. (2022). *Plant, Microbes and Diseases*. I.K. International Pvt. Ltd., Delhi.
2. Ownley B.H. and Trigiano R.N. (2016). *Plant Pathology Concepts and Laboratory Exercises* 3rd edition, CRC Press.
3. Singh, R.S. (2017). Introduction to Principles of Plant Pathology, 5th edition, Medtech, New Delhi.
4. Tronsmo A.M., Munk L., Anika D., Tronsmo A., Yuen J and Collinge D.B. (2020). *Plant Pathology and Plant Diseases*. CABI Publishing, U.S.A.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.