

<b>Paper Code</b>	NAG-110	<b>Cr. Hrs</b>	03 (Class Credits: 02; Lab Credits: 01)
<b>Paper Title</b>	Introductory Plant Pathology		
<b>Domain</b>	Natural Sciences		

<b>Course Introduction</b>		
Introductory Plant Pathology is an introductory one semester course that offers a broad introduction to plant diseases and the organisms that cause them. The material will focus on the four interacting factors necessary for disease to occur: the pathogen, the host, the environment, and time. With knowledge of these factors, you will begin to understand the nature of plant disease epidemics and how to manage them.		
<b>Learning Outcomes</b>		
On the completion of the course, the students will:		
<ol style="list-style-type: none"> <li>1. Recognize the signs and symptoms of plant disease.</li> <li>2. Compare and contrast the survival and spread of the major plant pathogen groups: fungi, bacteria, viruses, nematodes, parasitic plants.</li> <li>3. Explain how pathogens, hosts, and environments interact in plant disease epidemics.</li> <li>4. Explain disease cycles and use them to determine strategies for disease management.</li> <li>5. Assess the use of various strategies to manage plant disease epidemics.</li> <li>6. Discuss the social and economic impact of plant pathogens in a historical context and in current events.</li> </ol>		
<b>Course Content</b>		<b>Assignments/Readings</b>
<b>Week 1</b>	<u><b>THEORY</b></u> <b>Unit-I</b> 1.1 Introduction to Plant Pathology 1.2 Concept and History of Plant Pathology 1.3 Scope Plant Pathology	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
	<u><b>PRACTICAL</b></u> Introduction to different Lab Equipment and Techniques for Pathogen Isolation and Identification	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
<b>Week 2</b>	<u><b>THEORY</b></u> <b>Unit-II</b> 2.1 Definition of Disease in Plants 2.2 Types of Plant Diseases	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.

		<b>Assignment:</b> Preparation of report on major diseases of vegetables in Pakistan and their economic losses
	<b><u>PRACTICAL</u></b> Preparation of Growth media for Isolation of Fungi	Strange, R.N. 2003. Introduction to Plant Pathology. John Willey & Sons, New York.
<b>Week 3</b>	<b><u>THEORY</u></b> <b>UNIT - III</b> 3.1 Economic importance of plant diseases 3.2 Major diseases, their pathogen, symptoms and control measures	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA
	<b><u>PRACTICAL</u></b> Isolation of fungal pathogens from diseased Plant samples	<b>Assignment:</b> Collection of diseased plant samples (at least 10) and isolation of the pathogen. Preparation of complete report.
<b>Week 4</b>	<b><u>THEORY</u></b> <b>Unit-IV</b> 4.1 Losses due to diseases in plants 4.2 Major diseases, their pathogen, symptoms and control measures	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA
	<b><u>PRACTICAL</u></b> Microscopic identification of fungal pathogens isolated from diseased samples.	Strange, R.N. 2003. Introduction to Plant Pathology. John Willey & Sons, New York.
<b>Week 5</b>	<b><u>THEORY</u></b> <b>Unit-V</b> 5.1 Nature and causes of (biotic and abiotic) diseases	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA
	<b><u>PRACTICAL</u></b> Preparation of Growth media for isolation of Bacterial pathogens from diseased Plant samples	Strange, R.N. 2003. Introduction to Plant Pathology. John Willey & Sons, New York.
<b>Week 6</b>	<b><u>THEORY</u></b>	Strange, R.N. 2003. Introduction to Plant

	<b>Unit-VI</b> 6.1 Disease triangle 6.2 Disease Quadrangle	Pathology. John Willey & Sons, New York.
	<b><u>PRACTICAL</u></b> Microscopic identification of bacterial pathogens isolated from different diseased plant samples.	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
<b>Week 7</b>	<b><u>THEORY</u></b> <b>Unit-VII</b> 7.1 Disease cycle of different Plant Pathogens 7.2 Pathogenicity of different Plant Pathogens	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
	<b><u>PRACTICAL</u></b> Identification of different isolated Plant Pathogens	Compendia of Plant pathogens. American Phytopathological Society, St. Paul, Minnesota, USA.
<b>Week 8</b>	<b><u>THEORY</u></b> <b>Unit-VIII</b> 8.1 Detailed study of component of Plant Disease development	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
	<b><u>PRACTICAL</u></b> Identification of different isolated Plant Pathogens	Compendia of plant pathogens. American Phytopathological Society, St. Paul, Minnesota, USA.
<b>Week 9</b>	<b>MID-TERM</b>	
<b>Week 10</b>	<b><u>THEORY</u></b> <b>Unit-IX</b> 9.1 Principles of plant disease management	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA. <b>Assignment:</b> Prepare a report on major diseases of cash crops.
	<b><u>PRACTICAL</u></b> Identification of isolated Plant Pathogens	Naqvi, S.A.M.H. 2004. Diseases of Fruits and Vegetables: Diagnosis and Management. Vol. 1 & 2.

		Kluwer Academic Publishers.
Week 11	<b><u>THEORY</u></b> <b>Unit-X</b> 10.1 Management of Plant Diseases	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
	<b><u>PRACTICAL</u></b> Identification of plant pathogens isolated from different diseased samples.	Naqvi, S.A.M.H. 2004. Diseases of Fruits and Vegetables: Diagnosis and Management. Vol. 1 & 2. Kluwer Academic Publishers.
Week 12	<b><u>THEORY</u></b> <b>Unit-XI</b> 11.1 Symptoms, etiology, mode of infection,	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
	<b><u>PRACTICAL</u></b> Visit to areas and sampling of more diseased specimens.	Field visit
Week 13	<b><u>THEORY</u></b> <b>Unit-XII</b> 12.1 Mechanisms of host infection by pathogens	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
	<b><u>PRACTICAL</u></b> Processing of collected diseased samples.	Report Preparation of isolated and identified Plant Pathogens
Week 14	<b><u>THEORY</u></b> <b>Unit-XIII</b> 13.1 Concept of Resistance and susceptibility	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
	<b><u>PRACTICAL</u></b> Preservation isolated and identified pathogens	Report Preparation of isolated and identified Plant Pathogens
Week 15	<b><u>THEORY</u></b> <b>Unit-XIV</b> 14.1 Economically important Plant diseases and their Pathogens	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
	<b><u>PRACTICAL</u></b> Preparation of permanent mounts.	Report Preparation of isolated and identified Plant Pathogens

		<b>Assignment:</b> Submission of at least 5 permanent mounts of the pathogens isolated from vegetable diseased samples.
<b>Week 16</b>	<b><u>THEORY</u></b> <b>Unit-XV</b> 15.1 Economically important diseases and their Pathogens	Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.
	<b>PRACTICAL</b> Preparation of permanent mounts.	Submission of at least 5 permanent mounts of the pathogens isolated from vegetable diseased samples.
<b>FINAL TERM</b>		
<b>Textbooks and Reading Material</b>		
<ul style="list-style-type: none"> <li>• Textbooks.</li> </ul> <p>In the detail course outline, one may mention chapters of the textbook with the content topics</p> <ul style="list-style-type: none"> <li>• Suggested Readings <ul style="list-style-type: none"> <li>○ Books</li> </ul> </li> </ul> <ol style="list-style-type: none"> <li>1. Agrios, G.N. 2005. Plant Pathology, 5th edition, Academic Press, New York, USA.</li> <li>2. Ahmad, I. and A.R. Bhutta. 2005. A Text Book of Introductory Plant Pathology. Published by National Book Foundation, Islamabad, Pakistan.</li> <li>3. Hafiz, A. 1986. Plant Diseases. Pakistan Agricultural Research Council, Islamabad, Pakistan.</li> <li>4. Mathew, J.D. 2003. Molecular Plant Pathology. Bios Scientific Publishers Ltd. UK.</li> <li>5. Mehrotra, R.S. and A. Agarwal. 2003. Plant Pathology, 2nd Edition. TATA McGraw Hill. Pub. Company Ltd. New Dehli.</li> <li>6. Chaube, H.S. and R. Singh. 2002. Introductory Plant Pathology. International Book Distributing Co.</li> <li>7. Strange, R.N. 2003. Introduction to Plant Pathology. John Willey &amp; Sons, New York.</li> </ol> <p>Journal</p> <p>Articles/ Reports</p> <p style="padding-left: 40px;">Resources will be shared during class</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• It is preferable to use latest available editions of books. Mention the publisher &amp; year of publication.</li> <li>• The References/ bibliography may be in accordance with the typing manual of the concerned faculty/subject. Preferably follow APA 7<sup>th</sup> Edition publication manual.</li> </ul>		

### Teaching Learning Strategies

1. Present real-life scenarios or case studies where students analyze symptoms, diagnose diseases, and propose management strategies.
2. Incorporate online platforms for virtual field trips, webinars with experts, or discussion forums for sharing articles and research papers.
3. Utilize multimedia resources such as videos, animations, and interactive simulations to illustrate disease life cycles, pathogen behavior, and crop responses.
4. Facilitate peer teaching sessions where students research and present on assigned topics related to vegetable crop diseases.
5. Invite guest speakers who are experts in plant pathology or experienced growers to share their knowledge and practical experiences.
6. Arrange Q&A sessions to allow students to interact directly with professionals and gain insights into current industry practices.
7. Organize field trips to local farms, agricultural extension centers, or research institutions where students can observe diseases in real crops and interact with professionals.
8. Include field or laboratory-based assessments where students demonstrate their ability to apply learned concepts to real-world situations.

### Assignments: Types and Number with Calendar

**Mentioned in course content**

### Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.