

Department of Plant Pathology
Faculty of Agricultural Sciences
University of the Punjab, Lahore
Course Outline



Programme	B.Sc. (Hons.) Agriculture (Plant Pathology) 4 Year program	Course Code	PP-403	Credit Hours	3(2-1)
Course Title	Diseases of vegetable crops				
Course Introduction					
<p>This course offers a comprehensive exploration of plant pathology focused on vegetable crops. Over the semester, we will cover essential topics such as disease identification, pathogen biology, epidemiology, and integrated disease management strategies. By blending theoretical knowledge with practical applications, students will acquire the skills necessary to identify, manage, and prevent diseases that impact vegetable crop health and productivity. The course is designed to navigate the intricate dynamics between pathogens, vegetables, and their environment, aiming to optimize sustainable vegetable crop production through effective disease control measures.</p>					
Learning Outcomes					
<p>On the completion of the course, the students will:</p> <ol style="list-style-type: none"> 1. Students will acquire a comprehensive understanding of the various diseases that affect vegetable crops, including their causes, symptoms, and methods of identification. 2. Students will be able to diagnose common vegetable crop diseases based on visual symptoms, signs of pathogens, and environmental factors. 3. Students will get knowledge of the life cycles of pathogens that cause diseases in vegetable crops, including how they spread and methods of disease transmission. 4. Students will get understanding regarding the economic impact of diseases on vegetable yield, quality, and marketability. 5. They will be able to recommend appropriate disease prevention measures, such as crop rotation, sanitation practices, use of resistant varieties, and chemical control options. 					
Course Content				Assignments/Readings	
Week 1	<p><u>THEORY</u></p> <p>Unit-I</p> <p>1.1 Importance and general symptoms of various vegetable diseases</p> <p>1.2 Major types of vegetables and their economic</p>			<p>Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.</p>	

	<p>significance</p> <p>1.3 Groups of major vegetable pathogens</p>	
	<p><u>PRACTICAL</u></p> <p>Survey of vegetable field areas and collection of diseased samples.</p>	<p>Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.</p>
Week 2	<p><u>THEORY</u></p> <p>Unit-II</p> <p>2.1 Diseases of pea & okra</p> <p>2.2 Fungal diseases, their pathogen, symptoms and control measures</p> <p>2.3 Bacterial diseases, pathogen, symptoms and control measures.</p>	<p>Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.</p> <p>Assignment: Preparation of report on major diseases of vegetables in Pakistan and their economic losses</p>
	<p><u>PRACTICAL</u></p> <p>Isolation techniques for pathogen from diseased vegetable samples (media preparation, sterilization and inoculation)</p>	<p>Compendia of cucurbits, onion and garlic, potato, tomato and pea diseases. American Phytopathological Society, St. Paul, Minnesota, USA.</p>
Week 3	<p><u>THEORY</u></p> <p>UNIT - III</p> <p>3.1 Diseases of chilies & eggplant</p> <p>3.2 Fungal diseases, their pathogen, symptoms and control measures</p> <p>3.3 Bacterial diseases, pathogen, symptoms and control measures.</p>	<p>Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.</p>
	<p><u>PRACTICAL</u></p> <p>Isolation of fungal pathogens from diseased samples of vegetables from solanaceae family.</p>	<p>Assignment: Collection of vegetable diseased samples (at least 10) and identification of the pathogen. Preparation of complete report.</p>
Week 4	<p><u>THEORY</u></p> <p>Unit-IV</p>	<p>Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.</p>

	<p>4.1 Diseases of tomato & potato</p> <p>4.2 Fungal diseases, their pathogen, symptoms and control measures</p> <p>4.3 Bacterial diseases, their pathogen, symptoms and control measures</p>	
	<p><u>PRACTICAL</u></p> <p>Microscopic identification of fungal pathogens isolated from diseased samples of vegetables from solanaceae family.</p>	<p>Compendia of cucurbits, onion and garlic, potato, tomato and pea diseases. American Phytopathological Society, St. Paul, Minnesota, USA.</p>
Week 5	<p><u>THEORY</u></p> <p>Unit-V</p> <p>5.1 Diseases of cucurbits (gourd, cucumber, squash, melon)</p> <p>5.2 Fungal diseases, their pathogen, symptoms and control measures</p> <p>5.2 Bacterial diseases, their pathogen, symptoms and control measures</p>	<p>Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.</p>
	<p><u>PRACTICAL</u></p> <p>Isolation of fungal pathogens from diseased samples of vegetables from cucurbits.</p>	<p>Compendia of cucurbits, onion and garlic, potato, tomato and pea diseases. American Phytopathological Society, St. Paul, Minnesota, USA.</p>
Week 6	<p><u>THEORY</u></p> <p>Unit-VI</p> <p>6.1 Diseases of onion</p> <p>6.2 Fungal diseases, their pathogen, symptoms and control measures</p> <p>6.3 Bacterial diseases of onion</p>	<p>Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.</p>
	<p><u>PRACTICAL</u></p> <p>Microscopic identification of fungal pathogens from diseased samples of vegetables from</p>	<p>Compendia of cucurbits, onion and garlic, potato, tomato and pea diseases. American Phytopathological Society, St. Paul,</p>

	cucurbits.	Minnesota, USA.
Week 7	<p><u>THEORY</u></p> <p>Unit-VII</p> <p>7.1 Diseases of garlic</p> <p>7.2 Fungal diseases, their pathogen, symptoms and control measures</p> <p>7.3 Bacterial diseases, their pathogen, symptoms and control measures</p>	Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.
	<p><u>PRACTICAL</u></p> <p>Isolation of fungal pathogens from diseased samples of onion and garlic.</p>	Compendia of cucurbits, onion and garlic, potato, tomato and pea diseases. American Phytopathological Society, St. Paul, Minnesota, USA.
Week 8	<p><u>THEORY</u></p> <p>Unit-VIII</p> <p>8.1 Diseases of cabbage & cauliflower</p> <p>8.2 Fungal diseases, their pathogen, symptoms and control measures</p> <p>8.3 Bacterial diseases, their pathogens, symptoms and control measures</p>	Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.
	<p><u>PRACTICAL</u></p> <p>Identification of fungal pathogens from diseased samples of onion and garlic.</p>	Compendia of cucurbits, onion and garlic, potato, tomato and pea diseases. American Phytopathological Society, St. Paul, Minnesota, USA.
Week 9	MID-TERM	
Week 10	<p><u>THEORY</u></p> <p>Unit-IX</p> <p>9.1 Diseases of radish & carrot</p> <p>9.2 Fungal diseases, their pathogen, symptoms and control measures</p>	<p>Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.</p> <p>Assignment: Prepare a report on major diseases of vegetables in tunnel farming</p>

	9.3 Bacterial diseases, their pathogen, symptoms and control measures	
	<u>PRACTICAL</u> Isolation of fungal pathogens from diseased samples of crucifer family	Naqvi, S.A.M.H. 2004. Diseases of Fruits and Vegetables: Diagnosis and Management. Vol. 1 & 2. Kluwer Academic Publishers.
Week 11	<u>THEORY</u> Unit-X 10.1 Diseases of lettuce & spinach 10.2 Fungal diseases, their pathogen, symptoms and control measures 10.3 Bacterial diseases, their pathogen, symptoms and control measures	Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.
	<u>PRACTICAL</u> Identification of fungal pathogens from diseased samples of crucifer family.	Naqvi, S.A.M.H. 2004. Diseases of Fruits and Vegetables: Diagnosis and Management. Vol. 1 & 2. Kluwer Academic Publishers.
Week 12	<u>THEORY</u> Unit-XI 11.1 Tunnel farming & vegetable diseases 11.2 Fungal diseases, their pathogen, symptoms and control measures 11.3 Bacterial diseases, their pathogen, symptoms and control measures	Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.
	<u>PRACTICAL</u> Visit to areas of tunnel farming and sampling of diseased specimens.	Field visit
Week 13	<u>THEORY</u> Unit-XII 12.1 Diseases of non-traditional vegetables 12.2 Fungal diseases, their pathogen, symptoms	Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.

	and control measures 12.3 Bacterial diseases, their pathogen, symptoms and control measures	
	<u>PRACTICAL</u> Processing of collected diseased samples from vegetable tunnels.	<u>Reading</u> Internet PowerPoint slides And research articles
Week 14	<u>THEORY</u> Unit-XIII 13.1 Viral diseases of cucurbits & cruciferous vegetables 13.2 symptoms and control measures	Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.
	<u>PRACTICAL</u> Preservation of vegetable diseased samples.	<u>Reading</u> Internet PowerPoint slides And research articles
Week 15	<u>THEORY</u> Unit-XIV 14.1 Viral diseases of the vegetables of solanaceae family 14.2 symptoms and control measures	Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.
	<u>PRACTICAL</u> Preparation of permanent mounts.	<u>Reading</u> Internet PowerPoint slides And research articles Assignment: submission of at least 5 permanent mounts of the pathogens isolated from vegetable diseased samples.
Week 16	<u>THEORY</u> Unit-XV 15.1 Nematodes and their infections in vegetables 15.2 symptoms and control measures	Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer.

	<p>PRACTICAL</p> <p>Preparation of permanent mounts.</p>	<p><u>Reading</u></p> <p>Internet PowerPoint slides And research articles</p>
<p>FINAL TERM</p>		
<p>Textbooks and Reading Material</p>		
<ul style="list-style-type: none"> • Textbooks. <p>In the detail course outline, one may mention chapters of the textbook with the content topics</p> <ul style="list-style-type: none"> • Suggested Readings <ul style="list-style-type: none"> ○ Books • Bhutta. A.R. 2010. Text book of Introductory Seed Pathology. HEC Pakistan. • Compendia of cucurbits, onion and garlic, potato, tomato and pea diseases. American Phytopathological Society, St. Paul, Minnesota, USA. • Chand, G., N. Akhtar and S. Kumar. 2020. Diseases of Fruits and Vegetable Crops: Recent Management Approaches. Apple Academic Press. • Chowdappa, P. 2015. Diseases of Field and Horticultural Crops. Astral international, Daya publishing house, India • Dixon, D.R. 1981. Vegetable Crop Diseases. McMillan Press, London, UK. • Gupta, V.K. and Y.S. Paal. 2001. Diseases of Vegetables Crops. Kalyani Publishers, New Delhi, India. • Hafiz, A. 1986. Plant Diseases. Pakistan Agricultural Research Council, Islamabad, Pakistan. • Kamalvanshi, M. 2015. Disease of Vegetable Crops: Identification, Diagnosis and Treatment. Random publications. New Delhi. • Koike, S., P. Gladders and A. Paulus. 2006. Vegetable Diseases: A Colour Handbook Manson Publishing Ltd. • Mukerji, K.G. 2004. Fruit and Vegetable Diseases. Springer. • Naqvi, S.A.M.H. 2004. Diseases of Fruits and Vegetables: Diagnosis and Management. Vol. 1 & 2. Kluwer Academic Publishers. • Singh, R.S. 2023. Diseases of Vegetable Crops. 3rd Edition. • Sherf, A. F. and A. A. MacNab.1986. Vegetable Diseases and their Control. John Wiley & Sons Inc. 		

- Steferud, A. 2009. Diseases of Vegetable Crops. Biotech Books.
 - Journal Articles/ Reports
 Resources will be shared during class
- It is preferable to use latest available editions of books. Mention the publisher & year of publication.
- The References/ bibliography may be in accordance with the typing manual of the concerned faculty/subject. Preferably follow APA 7th Edition publication manual.

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.
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