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**Department of PlantProtection**

**College of Agricultural Engineering Sciences University of Salahaddin**

**Subject: Horticulture Diseases**

**Course Book – (4th  class)**

**Theory Lecturer's name: Majid Hassan Mustafa, PhD**

**Course Book – (Year 4)**

**Lecturer's name**

**Academic Year: 2023/2024**

**Course Book**

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| **1. Course name** | **Horticulture Diseases** | |
| **2. Lecturer in charge** | **Dr. Majid Hassan Mustafa** | |
| **3. Department/ College** | **Department of PlantProtection/ College of Agricultural Engineering Sciences University of Salahaddin** | |
| **4. Contact** | **e-mail: majid.mustafa@su.edu.krd**  **Tel: 0750 4439693** | |
| **5. Time (in hours) per week** | **For example Theory: 2**  **Practical: 3** | |
| **6. Office hours** | **8:30 – 2:00 from Sunday to Thursday** | |
| **7. Course code** |  | |
| **8. Teacher's academic profile** | **Majid Hassan Mustafa:**  Doctor of philosophy (PhD) in Disease resistance, graduated in Milan university, Italy, 2022. My thesis title was “Brown Rot disease development in peach P. persica L. Batsch): from fungal biology to high throughput on field phenotyping”. I obtained my Master of Science in Integrated pest management (IPM) of Mediterranean fruit, in Istituto Agronomico Mediterraneo di Bari (IAMB), Italy, 2015. Thesis title “Investigation into Auchenorrhyncha species, putative vectors of "Bois noir" and "Flavescence dorée", in Apulian vineyards using different molecular techniques”. My bachelor’s degree (BSc) in Plant Protection, University of Salahaddin-Erbil, Iraq, 2010. | |
| **9. Keywords** | Horticulture Disease, Plant Pathogens, Key Diseases, Disease management | |
| **10. Course overview:**  This advanced undergraduate course offers an in-depth exploration of horticultural diseases, targeting key pathogens and the diseases they cause in a variety of horticultural crops. The course begins with foundational concepts, including the economic and ecological impacts of plant diseases and the historical context of plant pathology. Students will delve into the disease triangle—comprising the host, pathogen, and environment—examining how these elements interact to influence disease development. The curriculum covers the identification and diagnostic techniques for various biotic causal agents such as fungi, bacteria, viruses, and nematodes, alongside the typical symptoms these pathogens induce.  As the course progresses, students will engage with specific case studies on significant diseases affecting major horticultural crops, including apples, pears, stone fruits, members of the Solanaceae family (like tomatoes and potatoes), cucurbits, grapes, figs, and pomegranates. Each lecture will provide a comprehensive analysis of common diseases, detailing their symptoms, causal agents, and effective management strategies. This knowledge will be reinforced through practical assessments, including laboratory reports, case study analyses, and active class discussions. By the end of the course, students will have a robust understanding of how to diagnose, analyze, and manage horticultural diseases, equipping them for professional roles in horticulture, plant pathology, and agricultural management. | | |
| **11. Course objective:**  The course aims to equip students with a comprehensive understanding of horticultural diseases, focusing on the biological and environmental factors that contribute to disease development. Students will learn to define and describe fundamental concepts related to horticultural diseases and understand the dynamics of disease development, including the interaction of host, pathogen, and environment. The course will enable students to identify and diagnose symptoms caused by major biotic causal agents such as fungi, bacteria, viruses, and nematodes. Furthermore, students will analyze the impact of key diseases on various horticultural crops and develop integrated management strategies to effectively control and prevent these diseases. This knowledge will prepare students for advanced roles in horticulture, plant pathology, and agricultural management. | | |
| **12. Student's obligation**  Students are expected to attend all lectures and laboratory sessions, actively participate in class discussions, and complete all assigned readings and coursework on time. They must conduct laboratory experiments safely and responsibly, maintain accurate lab records, and submit detailed laboratory reports. Regular quizzes and exams will assess their understanding of theoretical concepts, while a final project involving a comprehensive case study analysis and presentation will demonstrate their practical skills. Students are also required to engage in group activities and contribute to collaborative projects, ensuring a thorough grasp of integrated disease management strategies. | | |
| **13. Forms of teaching**  Effective teaching is essential for providing students with a well-rounded and interesting education. To give students with a well-rounded learning experience, we will use the following teaching methods in our classes:  1- PowerPoint presentations: To offer a summary of each course, we will utilize data show presentations in the form of PowerPoint slides. The lecturer will give extra in-depth information through narration, while the slides will define the process of each lesson.  2- Using a whiteboard: A white board is also necessary for teaching and explaining different topics.  3- Laboratory sessions: For the practical portion, we will have laboratory sessions in the Department of Plant Protection's plant pathology laboratory. Through this hands-on method, students allowed to gain a thorough understanding of the material, providing a useful and interactive learning experience.  4- Field visits: to forests, parks (i.e., GirdaRasha). | | |
| **14. Assessment scheme**  Students must pass four tests, two of which are theoretical and two of which are practical. The writing examination is worth 100 points, including 65% for theoretical tests and 35% for practical assessments. The theoretical tests consist of a 15% monthly exam and a 50% final exam. The practical section is divided into two monthly examinations of 15% each, and daily quizzes and interactions with laboratory tasks for 5%. | | |
| **15. Student learning outcome:**  By the end of this course, students should be able to:   * Explain the basic principles and significance of plant pathology. * Identify and describe various plant diseases and their causal agents. * Utilize laboratory equipment and microscopy techniques for diagnosing plant diseases. * Perform effective plant disease sampling and accurately isolate plant pathogens. * Analyze plant disease data and develop appropriate management strategies. * Apply integrated disease management practices in real-world agricultural settings.   These outcomes ensure that students will possess a comprehensive understanding of plant diseases, from fundamental concepts to practical applications, preparing them for professional roles in horticulture and plant pathology. | | |
| **16. Course Reading List and References‌:**   1. Introduction to Plant Pathology by Richard N. Strange 2. Plant Pathology: Concepts and Laboratory Exercises by Bonnie H. Ownley and Robert N. Trigiano 3. Plant Disease: A Threat to Global Food Security edited by Peter Scott, Thomas K. Gottwald, and Barry E. Slusarenko 4. Compendium of Plant Disease Series by The American Phytopathological Society (APS) 5. The Fungal Community: Its Organization and Role in the Ecosystem edited by John Dighton, James F. White Jr., and Peter Oudemans 6. Plant Pathogenesis and Disease Control edited by Hachiro Oku | | |
| **17. The Topics:** | | **Lecturer's name** |
| Lecture 1: Introduction to Horticulture Disease  Lecture 2: Disease Development  Lecture 3: Biotic Causal Agents and Their Important Symptoms  Lecture 4: Key Diseases of Apple and Pear  Lecture 5: Key Diseases of Stone Fruits  Lecture: 1st Exam  Lecture 6: Key Diseases of Solanaceae Family (Tomato, Potato, Eggplant, Pepper)  Lecture 7: Key Diseases of Cucurbitaceae Family  Lecture 8: Key Diseases of Grape  Lecture 9: Key Diseases of Fig  Lecture 10: Key Diseases of Pomegranate  Lecture: 2st Exam | | **Majid Hassan Mustafa (2 hrs each)** |
| **18. Practical Topics (If there is any)** | |  |
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| **19. Examinations:**  **Definitions**, such as: Plant Pathology, Parasite, Biotrophs, Saprophytes   1. **Explanations**, such as:   What are the main impacts (Damages) of plant Diseases?  What are the three stages of dampingoff?  What are the most common root symptoms?  What does the term "chemical injury" in plant disease mean?   1. **Filling blank**    1. There are three main ways that fungi can penetrate or enter the plants 1. ………….., 2.…………. and 3…………..    2. ……………. is a deterioration of the normal state of a plant that interrupts or modifies its vital functions.    3. Disease Infection of roots may cause roots to rot and this leads to ……………. 2. **Drawing** such as:    1. Draw a typical disease cycle of a plant leaf disease.   Draw a typical disease cycle of anthracnose disease. | | |
| **20. Extra notes:**   * When an exam postponed by a student, whatever be the reason, he/she has to do the exam within one week. It is the student's responsibility to contact the lecturer with the frame time to rearrange for an alternative exam. Failure to do so in a timely fashion may result in a zero grade for the missed exam. * Students are requested to attend practical courses with lab coats. | | |
| **21. Peer review پێداچوونه‌وه‌ی هاوه‌ڵ**  I thereby approve that the course is comprehensive and cover all aspects of the course. The subjects are arranged sequentially that enable the students to learn gradually step by step.  Name:  Degree:  Specialty:  Signed:  **Date:** | | |