****

**Department of Plant Protection**

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

**Subject: Forest Pathology**

**Course Book – (3rd class)**

**Theory Lecturer's name: Dr. Azhen Mohammad Hassan**

**Practical Lecturer's name: Mohammed Jamal Jameel, MSc.**

**Academic Year: 2023/2024**

**Course Book**

|  |  |  |
| --- | --- | --- |
| **1. Course name** | **Forest Pathology** | |
| **2. Lecturer in charge** | **Theory lecturer name:** **Azhen Mohammad Hassan**  **Practical Lecturer's name: Mohammed Jamal Jameel** | |
| **3. Department/ College** | **Plant Protection Dept./Agricultural Engineering Sciences College.** | |
| **4. Contact** | **e-mail:** azhen.hasan@su.edu.krd  **Tel: 0750 403 3957**  **e-mail: mohammed.kapkapci@ su.edu.krd**  **Tel: 0750 4538964** | |
| **5. Time (in hours) per week** | **Theory: 2**  **Practical: 3** | |
| **6. Office hours** | **8:30 – 11:30 from Sunday to Thursday** | |
| **7. Course code** |  | |
| **8. Teacher's academic profile** | **Azhen Mohammad Hassan**:  Doctor of Philosophy (PhD) in plant pathology, graduated from the College of Agricultural Engineering Sciences at Salahaddin University-Erbil, 2023. Thesis title: Molecular Identification and Mutation Detection of Qol Fungicides Resistance in *Alternaria solani* on Potato. Supervised by: Assist. Prof. Dr. Qasim Abdulla Marzani. My master's degree (MSc) is in plant pathology, from Salahaddin University, Erbil, Southern Region of Kurdistan,2010. Thesis title: Isolation and diagnosis of some fungi associated with pepper seeds and seedlings (*Capsicum annuum* L.) it’s controlled by biological and chemical methods. Supervised by: Assist. Prof. Hassan Husain Ali.  MY Bachelor degree (**BSc) – Agricultural - Plant Protection - University of Salahaddin – Erbil (2005).**  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  **Mohammed jamal jameel:**  I graduated from Salahaddin University in 2010. I was ranked as the 1st student. I started working as a plant protection assistant for 9 years after my graduation. In 2021 I got my MSc degree in Mycology, where my MSc project was related to the Detection of species diversity of Arbuscular Mycorrhizal Fungi (AMF). I became an Assistant Lecturer at my department and started teaching practical Mycology. | |
| **9. Keywords** | Forest pathology, Plant nursery diseases, Disease management. | |
| **10. Course overview:**  The course Forest Pathology aims to provide students with a deep understanding of the various diseases and disorders that affect forest trees and the impact that these can have on the ecosystem and economy. The course will cover various aspects of the subject including the identification and management of fungal infections in forests, the interplay between fungus and bacteria in forests and their respective roles in mutualism and decomposition, and the impact of abiotic factors such as temperature on forest health.  In addition, the course will also provide students with practical knowledge of the methods and techniques used in preventing and controlling diseases in forest ecosystems. This will include understanding disease control strategies, techniques for identifying and diagnosing fungal pathogens and understanding the economics of growing forest trees and how this can impact disease prevention and control.  Furthermore, the course will also provide students with an in-depth understanding of the various factors that contribute to the spread of diseases in forests and the measures that can be taken to mitigate these factors. This will include understanding the impact of climate change, habitat destruction, and human activities on the spread of diseases in forests. | | |
| **11. Course objective:**  The primary objective of this lecture on Forest Pathology is to provide students with a comprehensive understanding of plant pathology as it relates to forest and urban trees. The course will cover the major types of tree diseases, the deterioration of wood and wood products, and the principles of plant pathology, with a focus on disease diagnosis, disease-causing agents, mechanisms of pathogenesis, and effective disease management.  Additionally, this course aims to cultivate an appreciation for forest diseases and the practices necessary for their management and control. Through discussions on the peculiarities of protection, the course seeks to broaden students' understanding of the subject and achieve wider objectives. | | |
| **12. Student's obligation**  Students need to attend all lectures punctually and arrive prepared for daily quizzes and class participation. It is their responsibility to actively listen and take thorough notes on the explanations and details provided by the lecturer. To gain a more comprehensive understanding of the subject matter, it is also recommended that students regularly consult the course textbook. | | |
| **13. Forms of teaching**  Effective teaching is essential for providing students with a well-rounded and interesting education. To give students 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 whiteboard 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 are allowed to gain a thorough understanding of the material, providing a useful and interactive learning experience.  4- Field visits: to forests, parks (i.e., Sami Abdulrahman Park), and forest nurseries. | | |
| **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:   * The diagnosis of healthy forests and forest problems. * The diversity of forest problems with an emphasis on biotic pathogen and abiotic problems. * The aetiology, or proof of causality, of diseases. * Familiarize students with major diseases on forest tree diseases. * Mechanisms and genetics of resistance to diseases. * Interactions among the various organisms sharing woody plant hosts. * Strategies for management of pathogenic fungi. * Diagnosis of the diseases with techniques involved. * Familiarize students’ life cycles of the diseases to manage the diseases. | | |
| **16. Course Reading List and References‌:**  ▪ Key references:   1. Gonthier, P., Nicolotti, G., 2013. Infectious forest diseases, Infectious Forest Diseases. https://doi.org/10.1079/9781780640402.0000 2. Gregory, S.C., Redfern, D.B., 1998. Disease and Disorders of Forest Trees. Nature 136. 3. Horst, R.K., 2013. Field manual of diseases on trees and shrubs, Choice Reviews Online. https://doi.org/10.5860/choice.51-1234 4. Morowitz, H.J., 1982. Trees and forests. Hosp. Pract. (Off. Ed). 17, 24–25. https://doi.org/10.1080/21548331.1982.11702360 5. Mota, M.M., Vieira, P., 2008. Pine Wilt Disease: A Worldwide Threat to Forest Ecosystems. 6. Paine, T.D., Lieutier, F., 2016. Insects and diseases of Mediterranean forest systems, Insects and Diseases of Mediterranean Forest Systems. https://doi.org/10.1007/978-3-319-24744-1. 7. Parthasarathy, S., Thiribhuvanamala, G., Muthulakshmi, P., Angappan, K., 2021. Diseases of Forest Trees and their Management, Diseases of Forest Trees and their Management. CRC Press. https://doi.org/10.1201/9781003173861 8. Phillips, D. H., Burdekin, D.A., 1992. Diseases Of Forest And Ornamental Trees. 9. Roy, S., Banerjee, D., 2018. Diversity Of Endophytes In Tropical Forests. https://doi.org/10.1007/978-3-319-89833-9\_3 10. Schueffler, A., Anke, T., 2011. Endophytes of Forest Trees: Biology and Applications, Endophytes of Forest Trees: Biology and Applications. 11. Tattar, T.A., 1978. Diseases of Shade Trees, Diseases of Shade Trees. https://doi.org/10.1016/c2013-0-11586-3. 12. Garbelotto, M. and Gonthier, P. eds., 2018. *Forest Pathology and Plant Health*. MDPI. 13. GEORGE N. AGRIOS. (2005).Plant Pathology, Fifth Edition | | |
| **17. The Theoretical Topics:** | | **Lecturer's name** |
| **Lecture 1: Introduction to Forest Pathology**  **Lecture 2: Diseases Caused by Noninfectious Agents**  **Lecture 3: Root rot of tree diseases**  **Lecture 4: Canker Diseases of Tree**  ***First Exam***  **Lecture 5: Foliage diseases of Conifers: Needle cast**  **Lecture 6: Foliage diseases of hardwoods**  **Lecture 7: How Pathogens Cause Disease in Trees**  **Lecture 8: Management of forest disease**  ***Second Exam***  **Lecture 9:** **wood decay**  **Lecture10:** diagnosis of forest diseases  **Lecture11:** **Stem diseases: Galls and witch’s-brooms** | | Azhen Mohammad Hassan (2 hrs each) |
| 1. **Examinations:** 2. **Definitions**, such as Forest Pathology, Parasite, Biotrophs, Saprophytes 3. **Explanations**, such as:   What are the main impacts (Damages) of Forest Diseases?  What are the three stages of damping off?  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 hardwood leaf disease.    2. Draw a typical disease cycle of anthracnose on forest trees | | |
| 1. **Practical topics:**    * 1. Introduction to Forest Pathology      2. Symptom and Sign      3. Nursery disease      4. Scientific trip      5. Root Rot of Trees      6. First Exam      7. Foliage Diseases of conifers      8. Canker Disease      9. Foliage Diseases of Hardwood      10. Wilt Diseases      11. Second exam | | |
| 1. **Typical question:** 2. Write the main symptoms of this disease. 3. Enumerate spore types produced by rust fungi? 4. Why removing fallen leaves and plant debris are important? 5. What are the main control points for nursery diseases? 6. Define the following terms? 7. Write the names of these diseases with their pathogen names. | | |
| **22. 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. | | |
| **23. Peer review پێداچوونه‌وه‌ی هاوه‌ڵ**  I hereby approve that the course is comprehensive and covers all aspects of the course. The subjects are arranged sequentially enabling the students to learn gradually step by step.  Name:  Degree:  Specialty:  Signed:  Date: | | |