



Department of Plant Protection

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

Subject: Forest Pathology

Course Book – (3rd class)

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

**Practical Lecturer's name: Muhammed Zrar
Bakir, MSc.**

Academic Year: 2022/2023

Course Book

1. Course name	Forest Pathology
2. Lecturer in charge	Theory lecturers name: Majid Hassan Mustafa, PhD. Practical Lecturer's name: Mohamed Zrar Bakir
3. Department/ College	Plant Protection Dept./Agricultural Engineering Sciences College.
4. Contact	e-mail: majid.mustafa@su.edu.krd Tel: 0750 4439693 e-mail: muhammed.bakir@ su.edu.krd Tel: 0750 7889848
5. Time (in hours) per week	Theory: 2 Practical: 3
6. Office hours	8:30 – 2:00 from Sunday to Thursday
7. Course code	
8. Teacher's academic profile	<p>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 was “Investigation into Auchenorrhyncha species, putative vectors of "Bois noir" and "Flavescence dorée", in Apulian vineyards using different molecular techniques”. I obtained my bachelor’s degree (BSc) in Plant Protection, at University of Salahaddin-Erbil, Iraq, 2010. *****</p> <p>Mohamed Zrar Bakir: I have got BSc. in the Salahaddin University college of Agricultural Engineering Science plant protection department 2010-2011. I started working as academic staff in the plant protection dept. in 24/11/2011. Also i have got Master degree in plant pathology in the Salahaddin University 2017. I am a member in the Agriculture Engineering Syndicate in Erbil.</p>
9. Keywords	Forest pathology, Plant nursery diseases , Disease management, Disease Identification.
10. Course overview:	<p>The course of 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.</p> <p>In addition, the course will also provide students with practical knowledge on the methods and</p>

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

It is important for students to attend all lectures punctually and arrive prepared for daily quizzes and participation in class. 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 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., 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 etiology, 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 on order to manage the diseases.

16. Course Reading List and References:

▪ Key references:

- 1) FAO, 2009. Global review of forest pests and diseases. Management 2, 222.
- 2) Gonthier, P., Nicolotti, G., 2013. Infectious forest diseases, Infectious Forest Diseases. <https://doi.org/10.1079/9781780640402.0000>
- 3) Gregory, S.C., Redfern, D.B., 1998. Disease and Disorders of Forest Trees. Nature 136.
- 4) Horst, R.K., 2013. Field manual of diseases on trees and shrubs, Choice Reviews Online. <https://doi.org/10.5860/choice.51-1234>
- 5) Melissa Koch - Forest Talk, 2019. Do Trees Communicate?
- 6) Morowitz, H.J., 1982. Trees and forests. Hosp. Pract. (Off. Ed). 17, 24–25. <https://doi.org/10.1080/21548331.1982.11702360>
- 7) Mota, M.M., Vieira, P., 2008. Pine Wilt Disease: A Worldwide Threat to Forest Ecosystems.
- 8) 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>

<p>9) 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</p> <p>10) Phillips, D. H., Burdekin, D.A., 1992. Diseases Of Forest And Ornamental Trees.</p> <p>11) Phillips, D.H., Burdekin, D.A., 1982. Diseases Of Forest And Ornamental Trees, Suparyanto Dan Rosad (2015).</p> <p>12) Roy, S., Banerjee, D., 2018. Diversity Of Endophytes In Tropical Forests. https://doi.org/10.1007/978-3-319-89833-9_3</p> <p>13) Schueffler, A., Anke, T., 2011. Endophytes of Forest Trees: Biology and Applications, Endophytes of Forest Trees: Biology and Applications.</p> <p>14) Tattar, T.A., 1978. Diseases of Shade Trees, Diseases of Shade Trees. https://doi.org/10.1016/c2013-0-11586-3</p>	
17. The Theoretical Topics:	Lecturer's name
<p>Lecture 1: Introduction to the course and Plant Disease Main concepts</p> <p>Lecture 2: Plant disease Causes</p> <p>Lecture 3: Symptoms and signs of forest Disease</p> <p>Lecture 4: Diseases Caused by Non-infectious Agent</p> <p><i>Field visit to a forest plant nursery</i></p> <p>Lecture 5: How pathogens infect disease</p> <p><i>First Exam</i></p> <p>Lecture 6: Root Diseases of forest trees</p> <p>Lecture 7: Foliage Diseases of forest</p> <p>Lecture 8: Stem Diseases of forest</p> <p>Lecture 9: Diagnosis of forest diseases (procedures & methods)</p> <p><i>Field visit to a natural forest</i></p> <p>Lecture 10: Management Strategies of forest disease</p> <p><i>Second Exam</i></p>	<p>Majid Hassan Mustafa (2 hrs each)</p>
<p>19. Examinations:</p> <p>1. Definitions, such as: Forest Pathology, Parasite, Biotrophs, Saprophytes</p> <p>2. Explanations, such as: What are the main impacts (Damages) of Forest Diseases?</p>	

What are the three stages of dampingoff?

What are the most common root symptoms?

What does the term "chemical injury" in plant disease mean?

3. Filling blank

- a. There are three main ways that fungi can penetrate or enter the plants 1., 2..... and 3.....
- b. is a deterioration of the normal state of a plant that interrupts or modifies its vital functions.
- c. Disease Infection of roots may cause roots to rot and this leads to

4. Drawing such as:

- a. Draw a typical disease cycle of a hardwood leaf disease.
- b. Draw a typical disease cycle of anthracnose on forest trees

20. Practical topics:

- 1- Terminology
- 2- Introduction to plant diseases
- 3- Nursery diseases
- 4- Scientific trip
- 5- Root diseases of forest trees
- 6- First Exam
- 7- Leaf diseases of hardwood trees
- 8- Needle diseases (needle cast, needle blight)
- 9- Needle rust
- 10- Canker diseases
- 11- Second scientific trip
- 12- Second exam

21. Typical question:

- 1- Write the main symptoms of this disease?
- 2- Enumerate spore types produced by rust fungi?
- 3- Why removing fallen leaves and plant debris are important?
- 4- What are the main control points for nursery diseases?
- 5- Define the following terms?
- 6- Write the name 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

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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: