

Advances in Forest Disease Management

FORESTRY - FRST 506

Course Outline - January 2014

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Course Description

A combined undergraduate and graduate course in Forest Pathology designed to provide students with a better understanding of the mode of action of pathogens, the complex interactions between pathogens and their hosts, the epidemiology of tree diseases, and a thorough review and analysis of the past and recent developments in disease management.

Learning Outcomes

1. Develop a better understanding of the recent advances in Forest Pathology
2. Develop ability to read, summarize and critique scientific articles
3. Exercise student skills in presenting information in a concise but compelling manner
4. Exercise ability to participate in and lead discussions around a topic
5. Develop and exercise skills in writing a concise, critical review of current scientific literature on a selected topic

Context and Scope

Forest diseases are among the most important disturbance agents in natural and planted forests. In spite of centuries of research on the causes of diseases, the mode of action of pathogens, and the epidemiology and control of diseases, there are still many unanswered questions. The objective of this course is to develop a deeper understanding of what causes forest disease epidemics and what factors are conducive and result in epidemic developments. In order to do

so, we will scan the scientific literature and study the various management avenues available and assess the success and failure of past and present control approaches. We will develop case studies for each of several important diseases and in each case determine the reasons for the success and failure of the control measures and some proposed avenues for future research and development.

Evaluation

The course will require active participation from the students. The students will have to read scientific articles and present and discuss their analyses. Students will also prepare and present case studies of forest pathosystems and will give an overview of the pathogen biology and epidemiology, the causal factors in the epidemic development, the mode of action of the pathogen, and the various control strategies. The students will then determine the reasons for the failure or success of the control strategies and make recommendations for future management of the disease. Students will be evaluated on their case study presentation, on a term paper, and on class participation.

Grading

Paper presentation: 20%

Case study presentation: 30%

Participation*: 20%

Review paper: 30%

Total: 100

* Participation includes attendance and active participation in discussions.

Requirements

Students should have some previous courses in plant pathology, forest pathology, microbiology, or mycology. Exceptionally, highly motivated students could be accepted if they can demonstrate to the instructor that they have sufficient knowledge of the topics.

Schedule

Week Topic

1. Introduction to course, organization, scheduling
2. Lecture: Epidemiology, pathogen biology
3. Lecture: Infection process, host-pathogen interactions
4. Lab: Pathogen detection
5. Lecture: Genetic resistance, mechanisms, breeding
6. Lecture: Biological control, hyperparasites, hypovirulence
7. Lecture: Silvicultural approaches; pruning, stumping, thinning
8. Lecture: Guest speaker: TBD
9. Lecture: Guest speaker: TBD
10. Case-study presentation and discussion of current papers
11. Case-study presentation and discussion of current papers
12. Case-study presentation and discussion of current papers
13. Students hand in term papers

Suggested readings

The following are suggested as general readings that will help the students be better prepared for the lectures. Specific readings will be provided for each lectures.

Internet Resources:

<http://www.forestpathology.org/>