

Welcome to Principles of Plant Pathology (PIPa 5480)

Syllabus

Fall semester 2014

3 credits

Lectures: Monday and Wednesday from 8:30am - 9:20 am

Room: 491 Borlaug Hall

Laboratory: Monday from 9:35 am – 11:30 am

Room: 136 Growth Facilities

Class coordinator: Brett Arenz - aren0058@umn.edu

Office location: 105A Stakman

Office hours: Wednesday 1-2 pm or by arrangement

Other Instructors:

Dean Malvick – dmalvick@umn.edu

Carol Ishimaru – cishimar@umn.edu

Benham Lockhart – lockh002@umn.edu

Linda Kinkel – kinkel@umn.edu

Laboratory coordinator and instructor: Todd Burnes – burne002@umn.edu

Course prerequisites: Biology 1009 or equivalent

Course description

This course is intended for graduate students and undergraduate students in their third or fourth year that are interested in learning about principles of plant pathology, diseases that affect plants, microbiology and microbial and plant interactions. In this course students will learn principles of plant pathology through lectures and demonstrations and exercises in laboratory. Students will gain knowledge of mycology and select diseases caused by fungi within Ascomycota, Basidiomycota and the fungal-like Oomycota. Diseases caused by bacteria, nematodes, viruses, parasitic plants and abiotic damage are also examined. Lectures will include information concerning the history and importance of plant pathology, mycology, bacteriology, nematology, virology, infection process, genetics of host and microorganism interactions, epidemiology of diseases and disease control strategies. In the hands-on laboratory period the student will learn laboratory skills, gain experience using the microscope, work with microorganisms, learn diagnostic skills, and be able to recognize 30 plant diseases.

Recommended text and laboratory manual

The text book assigned for this course is Agrios G. 2005. Plant Pathology 5th edition Elsevier Academic Press. Burlington MA. 922 p. This book can be purchased at the St. Paul campus book store (\$96.00). A laboratory manual is also required for this course and will be provided on the first day of class.

An electronic version of the textbook is also available through the Library at the following link:

<http://site.ebrary.com.ezp1.lib.umn.edu/lib/uminnnesota/docDetail.action?docID=10169629>

Students with disabilities

The Department of Plant Pathology is committed to providing all students equal access to learning opportunities. If you need different accommodations that what is provided please let the instructor know as soon as possible. We are happy to work with you to provide and/or arrange reasonable accommodations. If you need further information contact Disabilities Services. Students registered with Disability Services, who have a letter requesting accommodations, are encouraged to contact the instructor early in the semester. Students who have, or think they may have, a disability (e.g. psychiatric, attentional, learning, vision, hearing, physical, or systemic), are invited to contact Disability Services for a confidential discussion at 612-626-1333 (V/TTY) or ds@umn.edu. Additional information is available at the DS website <http://ds.umn.edu>.

Student outcomes for this course

The students that complete this course will obtain laboratory skills working with microorganisms, have knowledge of basic principles and terminology of plant pathology, be able to recognize plant diseases and recommend control strategies.

Course Objectives

1. To give the student an overview of the discipline of plant pathology.
2. Learn the terminology of plant pathology and microbiology
3. Describe the interactions of the host and pathogen.
4. Learn management strategies to reduce the impact of disease.
5. Provide exercises in laboratory to gain experience working with and diagnosing diseases caused by fungi, bacteria, nematodes and viruses that cause plant diseases.
6. Learn specific diseases through demonstrations and displays in laboratory.

Schedule of lecture and reading assignments

Date of class	Lecture number	Topic	Assigned readings from text "Plant Pathology 5 th edition"	Instructor
Wednesday, September 3	1	Introduction to plant pathology	Chapter 1	Arenz
Monday, September 8	2	Introduction to mycology Parasitism and disease development	386-396 77-103	Arenz
Wednesday, September 10	3	Parasitism and disease development		Arenz
Monday, September 15	4	How pathogens attack plants	175-203	Arenz
Wednesday, September 17	5	How pathogens attack plants		Arenz
Monday, September 22	6	Fungal identification Diseases caused by Ascomycota	397-403 439-440 485-500	Arenz
Wednesday, September 24	7	Effects of pathogens on plant physiology function Diseases caused by Ascomycota	105-122 501-507	Arenz
Monday, September 29	8	Diseases caused by Ascomycota	448-452 510-514 523-540 546-550	Arenz
Wednesday, October 1	9	Lecture Exam 1		
Monday, October 6	10	Genetics of plant diseases Diseases caused by Basidiomycota	125-133 562-571 574-577 583-599	Arenz
Wednesday, October 8	11	Genetics of plant diseases	134-172	Arenz
Monday, October 13	12	Diseases caused by Basidiomycota Disease Profile Topic due!	604-610	Arenz
Wednesday, October 15	13	Diseases caused by Oomycota	404-433	Arenz
Monday, October 20	14	Diseases caused by Oomycota (Lab starts at 8:30 on this day)		Malvick
Wednesday, October 22	15	Introduction to plant parasitic nematodes	826-836	Arenz
Monday, October 27	16	Diseases caused by nematodes	838-853	Arenz
Wednesday, October 29	17	Environmental factors that cause plant diseases	358-383	Arenz
Monday, November 3	18	Environmental effects on the development of infectious plant diseases	249-262	Arenz
Wednesday, November 5	19	How plants defend themselves against pathogens I Disease Profile First Draft due!	207-246	Arenz
Monday, November 10	20	Introduction to plant viruses (Lab starts at 8:30 on this day)	724-756	Lockhart
Wednesday, November 12	21	Plant Pathogenic Bacteria Peer reviews of First Draft due!	616-626	Ishimaru
Monday, November 17	22	Plant Pathogenic Bacteria II		Ishimaru
Wednesday, November 19	23	How plants defend themselves against pathogens II		Arenz
Monday, November 24	24	Lecture Exam II		
Wednesday, November 26	25	Plant disease epidemiology	266-289	Kinkel
Monday, December 1	26	Diseases caused by parasitic higher plants	705-722	Arenz
Wednesday, December 3	27	Control of plant diseases	294-314	Arenz
Monday, December 8	28	Control of plant diseases	315-351	Arenz
Wednesday, December 10	29	Disease Profile Presentations Disease Profile Final Draft due!		Students!
Saturday, December 13 1:30 p.m.-3:30 p.m.		Disease Profile Presentations		Students!

Schedule of laboratory and reading assignments

Lab	Date	Lab topics
1	9-8	Introduction to plant pathology and mycology part I
2	9-15	Mycology part II
3	9-22	Diseases caused by Ascomycota part I
4	9-29	Diseases caused by Ascomycota part II
5	10-6	Diseases caused by Basidiomycota part I
6	10-13	Diseases caused by Basidiomycota part II
7	10-20	Diseases caused by Oomycota
8	10-27	Fungal isolation techniques Part I and Nematodes
9	11-3	Fungal isolation techniques Part II and abiotic plant damage
10	11-10	Viral Diseases
11	11-17	Bacteria part I
12	11-24	Bacteria part II and Stem Rust Differential Set
13	12-1	Parasitic seed plants
14	12-8	Lab Final Exam

Note: The schedule may be modified during the semester. You will be notified in lecture and or by e-mail of any substantial changes to the schedule above.

Student expectations for this course

The students are expected to attend each lecture and laboratory period during the semester and be prepared by reading all the assignments before class. The laboratory section will involve hands-on exercises and display material that will need to be completed each week so it is essential that the student read the laboratory manual before each class. No make-up laboratory times will be offered because of the time it takes to set-up a laboratory, scheduling of the room and the sensitive nature of the material presented in the laboratory section each week. Please contact the instructor as soon as possible if you need to miss a laboratory class period.

Student assessment

Online Article Discussion = 7.5%
In-Class Activities and Assignments = 7.5%
Lecture Exam 1 = 15%
Lecture Exam 2 = 15%
Disease Profile First Draft and Peer Review = 5%
Disease Profile Final Draft = 15%
Disease Profile Class Presentation = 5%
Laboratory worksheets 20%
Laboratory comprehensive final exam 10%

Online Article Discussion

Ten scientific articles will be assigned during the semester on a weekly basis via email, generally not including weeks which an exam is scheduled. Your responsibilities will include reading the articles and writing a short reaction online on the appropriate discussion forum on the Moodle class website. The reactions should be at least 2 paragraphs long.

The first paragraph of your reaction should be your general reaction to the paper. You don't need to summarize the article but concisely state what you found to be the most interesting aspect of the article or what most changed your preconceived notions about the subject? Your second paragraph should include a response to a question that has been previously asked by either the instructor or another student. Finally you should ask your own question, which other students may respond to.

Points will be awarded based on ability to make a satisfactory contribution to the discussion. Reactions are due Sundays at 12 am (midnight) on the week that the articles are assigned. Each student is expected to write one initial reaction for each article but you are welcome (and indeed encouraged) to make as many subsequent replies to the discussion as you wish.

In-Class Activities and Assignments

This category represents a series of short activities and student generated materials that generally can be completed in-class or in a short period of time outside of class. They will typically be announced during the class session and will be due by the end of the session or the start of the next session. These are not meant to be lengthy assignments but will provide a measure of the students active engagement in the class (and attendance ☺). Students whom are legitimately excused for missing class will not lose points.

Disease Profile

Each student is expected to conduct independent research on a specific plant disease and by the following deadlines deliver original material as follows:

October 13	Choose disease topic and clear with instructor
November 5	First draft of disease profile (2-3 pages) submitted for peer review
November 12	Peer reviews of first drafts due
November 17	Peer reviews returned to student
December 10	Final draft of disease profile (4-6 pages) submitted to instructor
December (10 or 13)	In-class presentation (10 minutes) of disease profile

A more specific rubric on what is expected for the disease profiles will be provided separately.

Laboratory worksheets

A worksheet will need to be completed for each laboratory session and handed in the same day at the end of the class period by 11:30 a.m. These worksheets will be evaluated, graded and handed back to you in the next laboratory period. If you miss a laboratory you will not get credit for the worksheet. Missing three or more laboratory sessions will result in a failing grade.

Laboratory exam

A laboratory exam will be given during the laboratory period 12-8-14 from 9:35a.m. - 11:30 a.m. This will be a comprehensive exam with stations containing material from previous laboratory classes with short answer questions.

Academic Dishonesty

Academic dishonesty in any portion of the academic work for this course shall be grounds for awarding a grade of F (represents failure).

Grading

Letter grades will be calculated by the following formula;

A = achievement that is outstanding relative the level necessary to meet course requirements.

B = achievement that is significantly above the level necessary to meet course requirements.

C = achievement that meets the course requirements in every respect.

D = achievement that meets the course requirements in most respects.

F = represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not complete and there was no agreement between the instructor and the student on the conditions for awarding of an Incomplete (I).

I = (Incomplete) Assigned at the discretion of the instructor when, due to extraordinary circumstances, e. g., hospitalization, a student is prevented from completing the work of the course on time. This grade requires a written agreement between instructor and the student.

Total Percentage of points	Letter grade
95.00 -100	A
90.00-94.99	A-
87.00-89.99	B+
83.00-86.99	B
80.00-82.99	B-
77.00-79.99	C+
73.00-76.99	C
70.00-72.99	C-
65.00-69.99	D+
60.00-64.99	D

59.99 and below	F
-----------------	---

Exam Policy

Students are expected to take exams at the times scheduled in the syllabus and or arranged by the instructor and the final exam at the time shown in the University of Minnesota calendar. Possible exceptions include serious illness, family emergencies or a legitimate conflict with recognized University activities. If you are unable to take an exam at the scheduled time please contact the instructor as soon as possible to make other arrangements.

If you miss an exam;

Contact your instructor immediately. Students missing exams for valid (e.g., medical/bereavement) reasons must notify the instructor in advance, where possible and provide documentation if requested. If a student is able to sit the exam within 48 hours of the original exam time they may arrange to do so without penalty. If a student is unable to sit an exam within 48 hours of the original exam time they will have their final exam weighted proportionally more. Students who miss an exam for a non-valid reason may request to take the exam within 48 hours of the original exam time, although they will have a 20% penalty deducted from their score. If a student is unable to sit an exam within 48 hours of the original exam time they will be assigned a score of zero for the exam.

If you are unable to take the final exam (ie. final class presentation);

If a student is unable to take the final examination at the scheduled time for medical or other adverse reason, she or he can and should apply for a special examination. Applications made on medical grounds should be accompanied by a medical certificate; those on the other grounds must be supported by a personal declaration stating the facts on which the application relies. Also, if you have a conflicting final exam time or three final exams within 16 hour period, you may request a time adjustment by contacting your college office and the instructors. Students should contact their instructor at least 1 week prior to the scheduled exam time to request consideration for a special examination.

Grading Disputes

Students who feel an assignment or exam questions have been graded incorrectly should submit a written explanation within one week of having the assignment or exam returned. If the disputed grade is a matter of opinion, the work will be given to two others (instructors, laboratory coordinator) for re-grading. Their decision will be final. Errors due to miscalculation will be corrected immediately. The student Resolution Center is also available to help resolve grade conflicts.