

SYLLABUS

Biology 4430: Introduction to Plant Pathology (4 credits)

Meets: Tuesday/Thursday 1:30-2:45 BNR 113

Instructor: **Madeleine Dupuy**

Office: BNR 40

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*Email (preferred): madeleine.dupuy@usu.edu

Office Hours: By appointment.

STUDENT LEARNING OUTCOMES:

- 1) Students will be able to define terminology used in plant pathology and describe major classifications of plant pathogens and their defining characteristics.
 - a. Students will attend lecture and participate in class discussion.
 - b. Students will be assessed on their knowledge of these basic facts in plant pathology through multiple choice questions on one midterm and one final exam.
- 2) Students will be able to recognize and name important plant pathogens, the diseases they cause, and describe disease symptoms. Students will be able to explain disease cycles of major plant pathogens and how management options fit into those disease cycles.
 - a. Students will attend lecture and participate in class discussion.
 - b. Student learning will be assessed with essay questions on one midterm and one final exam. Students will choose a plant pathogen and create an 8-minute presentation including description of the pathogen, life cycle of the pathogen, and management options and present to the class.
- 3) Students will develop laboratory skills needed by plant pathology professionals, be able to recognize and describe plant diseases and symptoms in live hosts, and compose a scientific manuscript demonstrating understanding of methods used in laboratory activities.
 - a. Students will work in groups to complete hands-on lab activities each week.
 - b. Students will turn in questions about the lab activity each week. Students will complete a final report in the style of a scientific manuscript on the Koch's postulates lab activity.

TEXT: Plant Pathology 5th Edition. George N. Agrios (optional but strongly recommended)

TENTATIVE COURSE SCHEDULE (BIOL 4430)
T/R BNR 113 1:30-2:45

<u>Date</u>	<u>Topic</u>
Jan.	9 Introduction to Plant Pathology (Ch. 1)
	11 Disease Development (Ch. 2)
	16 Mechanisms of Plant Disease (Ch. 3, 5)
	18 Environmental Effects on Plant Disease (Ch. 7)
	23 Disease Control: Exclusion, Eradication, and Chemicals (Ch. 9)
	25 Disease Control: Biocontrol and IPM (Ch. 9)
	30 Environmental Plant Disease (Ch. 10)
Feb.	1 Bacteria (Ch. 12)
	6 Bacteria (Ch. 12)
	8 Mollicutes (Ch. 12), Introduction to Fungi (Ch. 11)
	13 Fungi (Ch. 11)
	15 Fungi (Ch. 11)
	20 <u>Attend Monday classes</u>
	22 Viruses (Ch. 14)/ Assign presentation
	27 Viruses (Ch. 14)/Topic of presentation due
Mar.	1 <u>Midterm exam</u> / Presentation topics finalized
Mar.	5-9 <u>Spring Break</u>
	13 Nematodes (Ch. 15)
	15 Parasitic Plants (Ch. 13)
	20 Other Plant Disease-Causing Agents (Ch. 14, p. 816-823, Ch. 16)
	22 Plant Defense Mechanisms
	27 Disease Resistance (Ch. 4) and Biotechnology
	29 Post-Harvest Disease and Mycotoxins
Apr.	3 Plant Disease Epidemiology (Ch. 8)
	5 Forest Pathology (Ch. 11 pp. 604-611)
	10 Student Presentations
	12 Student Presentations
	17 Student Presentations
	19 Student Presentations
	24 Beneficial Fungi and Bacteria (Ch. 11 pp. 612-614)
	26 Optional review session
May	3 Final Exam 1:30-3:20

GRADES: Grading for Biol 4430 is done on a percentage basis of the total number of points for the term (100-93 =A, 92-90 = A-, 89-87 = B+, 86-83 = B, 82-80 = B-, 79-77 = C+, 76-73 = C, 72-70 = C-, 69-67 = D+, 66-63 = D, 62-60 = D-, below 60 = F)

	<u>% of total grade</u>
1) EXAMS	
- Midterm	25
- Comprehensive final exam	30
2) Plant disease case study presentation	20
3) LABORATORY*	<u>25</u>
	100

* The laboratory portion of the course will be graded separately by your TA.

Exams: The midterm exam will cover all lecture material up to and including the last lecture before the exam. The final exam is comprehensive and will cover all lecture material given during the semester.

Plant disease case study presentation: Each student will create a short presentation (~8 minutes, 2 minutes for questions) on a pathogen of their choice that includes: disease causal agent classification, symptoms, hosts, life cycle, and control options.

Makeup exams: Makeup exams will be given only if you notify your instructor at least one week prior to the exam or within 24 h of an unexpectedly missed exam.

Attendance: Attendance in lecture is not mandatory but is strongly encouraged. PowerPoint presentations will be made available online, but lectures will not be recorded.

Other:

The course fee for Biol 4430 is \$100 to be used for media, laboratory supplies, and graduate teaching assistants.

In cooperation with the Disability Resource Center, reasonable accommodation will be provided for students with disabilities. Students with disabilities should make arrangements with the instructor during the first week of class. Materials may be requested in an alternative format.

TENTATIVE LABORATORY SCHEDULE (BIOL 4430)
Thurs. VSB 236 3:00-4:50

<u>EXERCISE</u>			
Jan	11	NO LAB	No lab
	18	Lab 1	1. Microorganisms in air and on leaves, 2. serial dilution, 3. sterile technique, 4. Koch's Step 1
	25	Lab 2	1. Koch's Step 2, 2. Seed-borne pathogens, 3. Lab 1 results, subculture soil serial dilutions
Feb	1	Lab 3	1. Sunscald, 2. Microbial Antagonism, 3. Lab 2 results
	8	Lab 4	1. Koch's step 3, 2. Enzymes from <i>Erwinia</i> , 3. Lab 3 results
	15	Lab 5	1. Tobacco Mosaic Virus, 2. Koch's step 4
	22	Lab 6	Fungal Microscopy--major groups
Mar	1	Lab 7	1. Fungal Microscopy, 2. Teliospore germination, 3. TMV check-in
	8	NO LAB	Spring Break
	15	Lab 8	1. Teliospore germination results, 2. Powdery mildew identification, 3. Rust fungus life stages
	22	Lab 9	TMV symptoms and detection
	29	Lab 10	1. Extraction of nematodes from soil, 2. Nematode microscopy
Apr	5	Lab 11	Microbial Dispersal
	12	Lab 12	1. Hypersensitive Response, 2. Lab 11 results
	19	Lab 13	Lab 12 results
	26	NO LAB	No Lab

Lab Grades

The laboratory portion of BIOL 4430 will be worth 25% of your total grade for the class and will be graded by your TA as follows:

Lab Exercises	13%
Participation	2%
<u>Lab Report</u>	<u>10%</u>
Total	25%

- 1) Lab assignments are due at the beginning of lab each week. Late work will not be accepted and will be graded as "0".
- 2) You will lose 1 participation percentage point for each lab you miss with an unexcused absence. Your TA will judge whether absences are excused or unexcused. You will be allowed to make up work for excused absences.
- 3) Your Koch's Postulates report is due to your TA April 26th by 5:00PM (see Canvas for a grading rubric and example report).