

PIP 429 - General Plant Pathology, 3 credits
Fall 2017
Drs. Peever, Pappu and Gleason

GENERAL COURSE INFORMATION

OBJECTIVES:

To develop the concepts and define the terminology associated with the classification, symptoms, causes, development, and control of plant diseases. The emphasis will be on the concepts and terminology related to Plant Pathology. Principles of plant disease development and control will be illustrated with specific examples. Diagnosis and control of specific diseases will not be emphasized.

STUDENT LEARNING OUTCOMES:

- Use discipline-specific terminology appropriately
- Recognize, define and differentiate causes of plant diseases
- Recognize, define and differentiate major types of plant diseases
- Integrate knowledge of plant and pathogen biology and their interaction with the environment to implement effective disease control practices
- Recognize the impact of plant disease in the environment around us

PREREQUISITES: Bio S 102 and/or Bot 120

REQUIRED TEXT: Schumann, G.L. and C.J. D'Arcy. 2009. Essential Plant Pathology. 2nd edition. American Phytopathological Society. 384 pp.

WEB PAGE: We will use the Blackboard Learn site for this class

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EXAMINATIONS AND GRADING:

Dates for midterm and final exams are listed in the lecture outline. All exams will be held in Johnson Hall room 343 during class hours. Students are expected to be present for examinations at the designated time. **Make-up exams will not be given. IN CASE OF EMERGENCY**, one of the instructors or the Plant Pathology Department Office (509-335-9541) should be notified of your absence prior to the exam.

Points will be awarded for two in-class lecture exams and a final exam during exam week, weekly laboratory quizzes (13 quizzes with the two lowest scores dropped), one laboratory case study report (Factsheet), and your laboratory notebook. Grades are determined by the percentage of the total points accumulated. In past years, at least 95% was needed for an A, 90% for an A-, 85% for a B, 80% for a B-, 75% for a C, 70% for a C-, and 60% for a D.

Point totals are as follows:

3	Lecture examinations	300 pts
11	Laboratory quizzes	110 pts
1	Lab Case Study (factsheet)	90 pts
1	Laboratory notebook	<u>50 pts</u>
	Total	550 pts

Note: University policy (Acad. Reg. #90) states that Incompletes may only be awarded if: "the student is unable to complete their work on time due to circumstances beyond their control"

Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information contact a Disability Specialist on your home campus:

Pullman or WSU Online: 509-335-3417

<http://accesscenter.wsu.edu>, Access.Center@wsu.edu

Spokane: <http://spokane.wsu.edu/students/current/studentaffairs/disability/>

Tri-Cities: <http://www.tricity.wsu.edu/disability/>

Vancouver: 360-546-9138 <http://studentaffairs.vancouver.wsu.edu/student-resource-center/disability-services>

Academic integrity is the cornerstone of the university. You assume full responsibility for the content and integrity of the academic work you submit. You may collaborate with classmates on assignments, with the instructor's permission. However the guiding principle of academic integrity shall be that your submitted work, examinations, reports, and projects must be your own work. Any student who violates the University's standard of conduct relating to academic integrity will be referred to the Office of Student Conduct and may fail the assignment or the course. You can learn more about Academic Integrity on your campus using the URL listed in the Academic Regulations section or to <http://conduct.wsu.edu/academic-integrity-policies-and-resources>. Please use these resources to ensure that you don't inadvertently violate WSU's standard of conduct.

The Campus Safety Plan: Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (<http://safetyplan.wsu.edu/>) and visit the Office of Emergency Management web site (<http://oem.wsu.edu/>) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community

Everyone should also become familiar with the **WSU ALERT site** (<http://alert.wsu.edu>) where information about emergencies and other issues affecting WSU will be found. This site also provides information on the communication resources WSU will use to provide warning and notification during emergencies. It should be bookmarked on computers.

Finally, all students should go to the MyWSU portal at <http://mywsu.edu> and register their emergency contact information for the Crisis Communication System (CCS). Enter your network ID and password and you will be taken to the mywsu portal page. Look for the Pullman Emergency Information box on the left side of the page and click on Update Now to be taken to the registration page where you can enter your cell, landline, and email contact information as well as arrange for emergency text messages to be sent to your cell phone.

PIP 429 General Plant Pathology
Fall 2017
Lecture Schedule

Topic	Instructor	Date
Introduction	Peever	Aug 21
Causes of Plant Disease	Peever	Aug 23
Disease Cycle	Peever	Aug 28
Disease Cycle	Peever	Aug 30
LABOR DAY (no class)		Sept 4
Plant Pathogenic Fungi	Peever	Sept 6
Plant Pathogenic Fungi	Peever	Sept 11
Fungi - Disease Cycle Discussion/Case Study 1	Peever	Sept 13
Plant Pathogenic Fungi	Peever	Sept 18
Plant Pathogenic Fungi	Peever	Sept 20
Fungi - Disease Cycle Discussion/Case Study 2	Peever	Sept 25
EXAMINATION #1		Sept 27
Plant Pathogenic Bacteria	Pappu	Oct 2
Plant Pathogenic Bacteria	Pappu	Oct 4
Bacteria - Disease Cycle Discussion/Case Study 3	Pappu	Oct 9
Fastidious Prokaryotic Plant Pathogens	Pappu	Oct 11
Viruses	Pappu	Oct 16
Viruses	Pappu	Oct 18
Viruses - Disease Cycle Discussion/Case Study 4	Pappu	Oct 23
Viroids	Pappu	Oct 25
EXAMINATION #2		Oct 30
Nematodes	Gleason	Nov 1
Epidemiology	Peever	Nov 6
Epidemiology	Peever	Nov 8

Plant Disease Management	Pappu	Nov 13
Plant Disease Management	Pappu	Nov 15
THANKSGIVING BREAK		Nov 20
THANKSGIVING BREAK		Nov 22
Plant Disease Control - Case Study 5	Pappu	Nov 27
Plant Disease Control - Case Study 6	Pappu	Nov 29
CSI Pullman: A day in the life of a Disease Diagnostician	Bomberger	Dec 4
Impacts of Plant Diseases on Society - Case Study 7	Bomberger	Dec 6
Final Exam Week		Dec 11-Dec 15
FINAL EXAM: 3:10 to 5:10 pm Tuesday Dec. 12, 2017 in 343 Johnson Hall		

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Laboratory Schedule

Lab	Date	Topic
1	8/23	Diagnosis of plant problems, Type disease concept, Symptoms vs. Signs. Compound microscope use and specimen preparation.
2	8/30	Koch's postulates and isolation techniques: Aseptic technique, soil dilution, sterilization and disinfection.
3	9/6	Seedling diseases: Damping-off, seed rot and seedling blight diseases caused by lower fungi
4	9/13	Galls/Tumors, Decay diseases and Phyto bacteriology: Crown gall, Black knot, Bacterial soft rot and Wood decay diseases.
5	9/20	Powdery mildews: Identification of powdery mildew fungi collected from WSU campus and vicinity
6	9/27	Root rot, Foot rot and Vascular wilt diseases: Fusarium root rots and wilts, Aphanomyces root rot, clubroot of crucifers, <i>Cephalosporium</i> stripe.
7	10/4	Disease control with fungicides: Effect of fungicides on fungal growth, differential sensitivity, fungicide resistance
8	10/11	Smut diseases and Ergot: Common bunt, Loose smut, Flag smut, Boil smut, and Ergot of grasses.
9	10/18	Rust diseases: Black Stem Rust, Stripe Rust, Leaf Rust, white pine blister rust and Cedar-Apple Rust.
10	10/25	Epidemiology and Integrated Disease Management: Computer simulation of disease epidemics, effect of management strategies on epidemics, integrated disease control.
11	11/1	Plant diseases caused by nematodes: Biology, isolation, identification and control of plant-pathogenic nematodes.
12	11/8	Plant diseases caused by viruses and virus transmission: Bean common mosaic, bean yellow mosaic, and barley yellow dwarf, mechanical inoculation and vector transmission. <u>Laboratory 6 case study report due</u>
13	11/15	Pathogen detection I: ELISA techniques to detect bacterial and viral pathogens.
	11/22	THANKSGIVING BREAK – NO LAB

14	11/29	Pathogen detection II: PCR techniques to detect fungal and bacterial pathogens. Hand in notebooks and lab cleanup.
15	12/6	No Lab

SUPPLEMENTAL READING

- Agrios, G.N. 2005. *Plant Pathology*, 5th Ed. Elsevier Academic Press, New York. 922 pp.
- Alexopoulos, C.J. and C.W. Mims. 1979. *Introductory Mycology*. John Wiley & Sons, New York. 632 pp.
- Campbell, C.L. and L.V. Madden. 1990. *Introduction to Plant Disease Epidemiology*. John Wiley & Sons, New York. 532 pp.
- Carefoot, G.L. and E.R. Sprott. 1967. *Famine on the Wind: Man's Battle against Plant Disease*. Rand McNally & Co., 231 pp.
- Cook, R.J. and K.F. Baker. 1983. *The Nature and Practice of Biological Control of Plant Pathogens*. The American Phytopathological Society, St. Paul. 539 pp.
- Hull, R. 2002. *Matthews' Plant Virology*. Academic Press, San Diego, 1001 pp.
- Large, E.C. 1962. *The Advance of the Fungi*. Dover Publications, Inc, New York. 488 pp.
- Lucas, J. 1998. *Plant Pathology and Plant Pathogens*. Blackwell Science, Oxford. 274 pp.
- Maloy, O.C. 1993. *Plant Disease Control: Principles and Practice*. John Wiley & Sons, Inc., New York. 346 pp.
- Maloy, O. C. and T. D. Murray, eds. 2000. *Encyclopedia of Plant Pathology*. John Wiley & Sons, Inc, New York. 1346 pp.
- Parry, D. 1990. *Plant Pathology in Agriculture*. Cambridge University Press, Cambridge. 385 pp.
- Schumann, G.L. 1991. *Plant Diseases: Their Biology and Social Impact*. APS Press, St. Paul. 397 pp.
- Shurtleff, M.C. and C.W. Averre III. 1997. *Glossary of Plant-Pathological Terms*. APS Press, St. Paul. 361 pp.
- Walker, J.C. 1969. *Plant Pathology*. 3rd Edition. McGraw-Hill, Inc., New York. 819 pp.