

Fall 2021, BIOL 3680/5680 Syllabus

Plant Pathology (4 credit hours)

Instructor: Dr. Emily G. Cantonwine, Email: egcantonwine@valdosta.edu, Phone: 333-5337

Lecture: BC1202, TR - 9:30-10:45

Lab: BC2040, M - 2:00-4:50

Office hours: W & R 12:30-2:00 or by appointment

Course Description: Study of plant diseases with emphasis on disease etiology, pathogenesis, ecology of host/pathogen interaction, epidemiology, and strategies for disease control.

Learning Outcomes

Plant Pathology Knowledge – At the end of the course, students will be able to...

- Describe the process used to establish disease of a plant.
- Identify pathogen type by cellular/organismal structure.
- Predict pathogen type and ecology based on symptoms and signs of disease.
- Identify and describe disease cycles of plant diseases important to Georgia and the US.
- Relate plant/pathogen interactions to disease development.
- Explain biotic and abiotic factors that influence plant disease epidemics.
- Prescribe disease management strategies based on disease cycle information.
- Collect and interpret data.
- Compile and summarize information from various sources.

Professional Skills – This course will also provide opportunities to improve...

- Microscopy skills
- Attention to detail
- Critical thinking

Required Text: Schumann G.L. & D’Arcy, C.J. 2009. Essential Plant Pathology, Second Edition. APS Press, St. Paul, MN

Students are required to bring the syllabus, textbook, & lecture notes to each laboratory.

Important information:

- A grade of C or higher is required in this course to count towards a biology degree.
- If you have need for special arrangements to meet the requirements of this course, please contact the Access Office for Students with Disabilities in Nevins Hall, & discuss with me as soon as possible.

| Assessment | # | points each | points total | % | SCALE |
|-------------------|----------|--------------------|---------------------|----------|--------------|
| Unit Exams* | 3 | 100 | 300 | ~44.4% | A > 90% |
| Final Exam* | 1 | 125 | 125 | ~18.5% | B > 80% |
| Reading Quizzes* | 5 | 10 | 50 | ~7.4% | C > 70% |
| Lab assignments | 5 | 15 | 75 | ~11.1% | D > 60% |
| Lab Practical | 1 | 75 | 75 | ~11.1% | F < 60% |
| Report* | 1 | 50 | 50 | ~7.4% | |
| Total | | | 675 | | |

* *Assessment differences for BIOL 5680 &/or 3680 Honor's Option. See Assessments for details.*

Grade Calculation - Add up your points (minus any extra assignments allowing for dropped grades) and divide by 675 (or possible points if mid-class).

ASSESSMENTS

- **Exams:** There will be 3 unit exams, each worth 100 points. The format of these exams may include multiple choice, matching, fill-in-the-blank, true/false, and short answer questions. Make-up exams are an option for those with legitimate reasons. FYI, having 3 exams on the same day is not a legitimate reason. *Students wishing to take a makeup exam must contact me the day of the missed exam and must complete the make-up within 24 h of the missed exam.* Students may not take exams early, unless the excuse is university related. The Final exam is worth 125 points. 50 points will cover new material & the disease experiment, and 75 points will be over cumulative material. **BIOL 5680** exams may be more challenging than BIOL 3680 exams.
- **Reading Quizzes:** A selection of APSnet.org disease lessons, or similar, will be assigned throughout the course in which each student should read and answer a set of questions. We will discuss these assignments in class, and this material will be tested on the exams. Five of these reading assignments will be assessed using quizzes to evaluate student preparations for discussions. Each will be worth 10 points. If more than 5 quizzes are given, the lowest quiz scores will be dropped. Timed Quizzes will be available through BV for students participating remotely. The quizzes will open at the beginning of the normal class period. Make-up quizzes may or may not be permitted, depending on the excuse. FYI, a doctor's appointment is never an acceptable excuse in my class.
- **Lab Assignments:** There will be at least 5 assignments in lab, each worth 15 points. If more than 5 lab assignments occur, the lowest score(s) will be dropped.
- **Lab Practical:** One lab practical will be conducted to evaluate identification skills of symptoms and signs of plant pathogens.
- **Report:** Students will write a research report for a plant disease experiment conducted in lab. 10pt will be based on the experimental notebook (group), which should include all notes related to experimental design, set-up, maintenance, data, etc. The remaining 40pt will be the formal research report (individual). For **Honor's Option** students, this report is worth only 25pt, with the remaining 25pt coming from an additional paper on research trends for a pathosystem of interest. See me the first few weeks of class to select a pathosystem. For **BIOL 5680** students, the plant disease experiment report will be worth only 10pt. The remaining 40pt will come from a paper on research trends for a pathosystem of interest (20pt), and a paper on a topic related to his/her graduate research project (20pt). See me for pathosystem and topic approval. BIOL 5680 students must receive at least a 70% on the report and each paper to pass the class.
- **Extra Credit:** Although attendance is not required, it is rewarded with 10pts extra credit at the end of the semester for students who a) attend every lecture either in-person (beginning to end & staying on-task) &/or remotely before the next lecture period, and b) completes every lab (make-up labs will be granted for students with legitimate excuses). Additional extra credit opportunities may be provided as well. These will be presented in class or lab.

GENERAL RULES

- Lecture Attendance: DO NOT COME TO CLASS IF YOU ARE IN QUARANTINE OR IF YOU FEEL ILL! Although I highly encourage everyone to attend lectures in-person, there are remote attendance options! See the Extra Credit opportunity above.
- Lab Attendance: DO NOT COME TO LAB IF YOU ARE IN QUARANTINE OR IF YOU FEEL ILL! Students who are still in the running to earn the attendance extra credit may request make-up lab opportunities. The request must be made on or before the date of the missed lab.
- Access to the laboratory: The access code is _____. Avoid entering the lab during Dr. Carter's Dendrology classes, 9:30-12:00 on Thursdays and 11-1:50 on Fridays.
- Food and Drink in the Laboratory and Lecture Rooms: Drinks are permitted in lecture, but due to Covid, no food is allowed. No food or drink are allowed in the lab.
- Academic Integrity: I follow the Academic Honesty Policies and Procedures of the University and the Policy on Plagiarism composed by the Department of Biology. For more information, refer to www.valdosta.edu/academic/AcademicHonestyPoliciesandProcedures.shtml and www.valdosta.edu/biology/documents/biologyplagiarism.doc, respectively. "Academic Integrity/Honesty" means performing all academic work without plagiarism, cheating, lying, tampering, stealing, receiving unauthorized or illegitimate assistance from any other person, or using any source of information that is not common knowledge.

Tentative Schedule:

| Week | Lecture Topics | Reading Assignments (Chapters) | Lab |
|--------|--|--------------------------------|---|
| Aug 16 | Diagnosing Plant Diseases | 1 | Campus Tour – Lab Assignment I |
| Aug 23 | Fungal Pathogens | 2 | Signs, Symptoms & Fungal Asexual Structures |
| Aug 30 | Fungal Pathogens | 2 | Fungal Sexual Structures |
| Sep 6 | Bacterial Pathogens | 3 | No Lab |
| Sep 13 | EXAM 1 (Tuesday, Sept 14, Chapters 1-3) Nematode Pathogens | 4 | Oomycetes & Bacteria |
| Sep 20 | Nematode Pathogens; Viral Pathogens | 4, 5 | Bacteria, Fungal & Viral Diagnostics – Lab Assignments II & III assigned |
| Sep 27 | Viral Pathogens; Parasitic Plants | 5, 6 | Nematodes |
| Oct 4 | Abiotic Factors Experimental design continued | 7 | Disease Experimental Design – Lab Assignment IV |
| Oct 11 | <i>Fall Break;</i> EXAM 2 (October 14 Chapters 4-7) | | No Lab |
| Oct 18 | Types of Plant Diseases | 8 | Set-up experiment |
| Oct 25 | Types of Plant Diseases; Plant Pathogen Interactions | 8, 9 | LAB PRACTICAL |
| Nov 1 | Plant Pathogen Interactions | 9 | Types of Plant Disease – Lab Assignment V |
| Nov 8 | Plant Pathogen Interactions, Epidemiology | 9, 10 | Data collection; Introduction and methods due (first draft); Set-up group meeting for data analysis next week! |
| Nov 15 | Epidemiology | 10 | Data analysis Discussion of intro & methods; first draft of results due; data analysis & results questions answered |
| Nov 22 | EXAM 3 (Nov 26, Chapters 8-10); THANKSGIVING | -- | No Lab |
| Nov 29 | Disease management | 11 | Disease experiment notebook and report due |
| Final | FINAL EXAM - Thursday 8:00-10:00am Chapters 1-11, Disease Cycle Interpretation & lab experiment-related questions | | |

Valdosta State University General Educational Outcomes (GEO)

1. Students will demonstrate understanding of the society of the United States and its ideals. They will possess the requisite knowledge of the society of the United States, its ideals, and its functions to enable them to become informed and responsible citizens. They will understand the connections between the individual and society and the roles of social institutions. They will understand the structure and operational principles of the United States government and economic system. They will understand United States history and both the historical and present role of the United States in the world.
2. Students will demonstrate cross-cultural perspectives and knowledge of other societies. They will possess sufficient knowledge of various aspects of another culture, including the language, social and religious customs, aesthetic expression, geography, and intellectual and political history, to enable them to interact with individuals within that society from an informed perspective. They will possess an international viewpoint that will allow them to examine critically the culture of their own nation and to participate in global society.
3. Students will use computer and information technology when appropriate. They will demonstrate knowledge of computer concepts and terminology. They will possess basic working knowledge of a computer operating system. They will be able to use at least two software tools, such as word processors, spreadsheets, database management systems, or statistical packages. They will be able to find information using computer searching tools.
4. Students will express themselves clearly, logically and precisely in writing and in speaking, and they will demonstrate competence in reading and listening. They will display the ability to write coherently in standard English; to speak well; to read, to understand, and to interpret the content of written materials in various disciplines; and to listen effectively and to understand different modes of communication.
5. Students will demonstrate knowledge of scientific and mathematical principles and proficiency in laboratory practices. They will understand the basic concepts and principles underlying scientific methodology and be able to collect, analyze, and interpret data. They will learn a body of scientific knowledge and be able to judge the merits of arguments about scientific issues. They will be able to perform basic algebraic manipulations and to use fundamental algebraic concepts to solve word problems and equations. They will be able to use basic knowledge of statistics to interpret and to analyze data. They will be able to evaluate arguments based on quantitative data.
6. Students will demonstrate knowledge of diverse cultural heritages in the arts, the humanities, and the social sciences. They will develop understanding of the relationships among the visual and performing arts, literature and languages, and history and the social sciences. Students will be versed in approaches appropriate to the study of those disciplines; they will identify and respond to a variety of aesthetic experiences and engage in critical thinking about diverse issues. They will be able to identify the components of and respond to aesthetic experiences in the visual and performing arts. They will develop knowledge of world literature within its historical and cultural frameworks. They will understand modern issues within a historical context and the role of the individual in various forms of societies and governments.
7. Students will demonstrate the ability to analyze, to evaluate, and to make inferences from oral, written and visual materials. They will be skilled in inquiry, logical reasoning, and critical analysis. They will be able to acquire and evaluate relevant information, analyze arguments, synthesize facts and information, and offer logical arguments leading to creative solutions to problems.
8. Students will demonstrate knowledge of principles of ethics and their employment in the analysis and resolution of moral problems. They will recognize and understand issues in applied ethics. They will understand their own value systems in relation to other value systems. They will judge values and practices in a variety of disciplines.

Department of Biology Educational Outcomes (BEO)

1. Develop and test hypotheses, collect and analyze data, and present the results and conclusions in both written and oral format used in peer-reviewed journals and at scientific meetings.
2. Describe the evolutionary process responsible for biological diversity, explain the phylogenetic relationships among the other taxa of life, and provide illustrative examples.
3. Demonstrate an understanding of the cellular basis of life.
4. Relate the structure and function of DNA/RNA to the development of form and function of the organism and to heredity
5. Interpret ecological data pertaining to the behavior of the individual organism in its natural environment; to the structure and function of populations, communities, and ecosystems; and to human impacts on these systems and the environment.