

Mycology 26-321/521

Course Syllabus

Fall 2016

Instructor: Dr. Stephen Bentivenga (Office: 111C HSC; Phone: 7088; *bentiven@uwosh.edu*)

Office Hours: Tue-Thur., 2:00 - 3:00. Or by appointment.

Texts:

Required: *North American Mushrooms* by Miller and Miller

Other reading: McLaughlin et al. 2009. The Search for the Fungal Tree of Life. *Trends in Microbiology* 17: 488-497

Meeting Times: T-Th 9:10 - 11:10 a.m. (lecture + lab), Room 119 Halsey

Course Description:

This three credit-hour course will examine the biology of the true fungi and other groups of organisms traditionally classified with the fungi. Topics covered will include taxonomy, life history traits, ecology, physiology, and evolutionary biology of the major classes and orders of fungi. Particular emphasis will be placed on the impact of fungi on human affairs. Laboratory exercises will emphasize the identification of these orders.

This class is designed with a two-hour lecture period on Tuesdays and a two-hour lab period on Thursdays. We will not strictly follow this organization and often we will have lecture and lab exercises on the same day. This will allow for maximum flexibility in the presentation of material. The lecture and lab will be strongly integrated. Lab exercises will parallel the material presented in lecture and exams will cover material presented in both lecture and lab.

Traditionally, mycology is taught in a progression with the slime molds and “lower” fungi being covered early in the course. In this course, we will cover the “higher” fungi (mushrooms and the like) first, so students can learn how to identify these fungi while they are abundant in the field (September-October).

Course Objectives:

When you complete this class you should be able to:

1. Discuss the importance of fungi in various ecological roles
 2. Demonstrate an understanding of how fungi impact human affairs
 3. Outline the higher taxonomy of the fungi and how the fungi relate to other organisms
 4. Discuss the characteristics of the major classes and orders within the fungal kingdom
 5. Identify the major families and certain species of mushrooms and other macrofungi
 6. Demonstrate a working knowledge of how fungi grow and reproduce, and where and how they can be isolated
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Attendance Policy:

While there is no formal requirement, attendance in both lecture and laboratories is highly recommended. Mycology is a difficult topic with many new terms and concepts. Lectures will include much information not included in the textbook. The laboratories will include the observation of specimens and material that often cannot be made up if missed. Earning a high grade in the class will be difficult, if not impossible, without regular attendance. If you miss a class period, it is your responsibility to get notes from a fellow student and attempt to make up the lab work on your own time.

I will be taking attendance each day for my own information. Bonus points (2% of your final grade) will be awarded to all students who miss no more than one (1) scheduled class period for any reason.

Grading:

Pretest – 20 points
 3 Exams – 100 points each
 2 Projects – 50 points each

Grading scale – out of 420 points total:

100 – 93%	A
92.9 – 90%	A-
89.9 – 88%	B+
87.9 – 83%	B
82.9 – 80%	B-
79.9 – 78%	C+
77.9 – 73%	C
72.9 – 70%	C-
69.0 – 68%	D+
67.9 – 63%	D
62.9 – 60%	D-
< 60%	F

Exam Format:

My exams are difficult and require much preparation. There is simply too much information for you to successfully cram the night before the exam. However, if you take good notes, keep up with the reading, and begin your preparation well in advance, there is no reason you can't do well.

My philosophy of testing is that I do not believe in “trick questions.” I will never deliberately try to mislead students on an exam. In this class, there will be no distinction between lecture and lab; exams will contain material from both. Exam questions will consist of short-answer questions over terminology and taxonomy, as well as several longer essay questions that will test your knowledge of more complex concepts. Each exam will have several practical questions (about 25% of the exam) covering identification of lab material. Approximately 25% of the last exam will be comprehensive, covering concepts (NOT fine details) from the entire class.

Necessary Background:

This is an upper level biology class, and I will assume you have a strong background in general biology along with some basic knowledge of chemistry. If you struggle with basic concepts, then you will find this course extremely difficult. To ensure you are familiar with these concepts, I will require all students to correctly answer questions on a take-home pretest, covering the material listed below. This pretest (pp. 7-13 in the course packet) will be due on the 2nd day of class (13-Sep). I will award 10 points of extra credit if you turn it in on the first day of class (8-Sep). The important concepts you should understand include:

- differences between prokaryotes and eukaryotes
- cell structure
- functions of cellular organelles
- the cell cycle
- types of life cycles displayed by multicellular eukaryotes (zygotic meiosis, gametic meiosis, sporic meiosis)
- transcription and translation
- aerobic respiration and anaerobic fermentation
- ploidy or nuclear condition
- mitosis and meiosis
- Mendelian genetics (e.g., independent assortment of alleles)
- classes and functions of biological molecules
- phylogenetics, interpreting phylogenetic trees, types of data used in phylogenetic analyses

Make-up Exams:

I do not give make-up exams lightly. Make-up exams will be given only in extreme circumstances (such as the death of a close relative or medical emergency). I will require notification *prior* to the start of the exam as well as confirmation of the excuse. To be fair to those students who took the scheduled exam, make-up exams will generally be more difficult than the original exam. A make-up exam may take any format I deem appropriate (e.g., practical, essay, oral).

Outside Assistance:

I am willing to spend time outside of class with any student who is having difficulty. Lab material will be in the front cabinet for review. You may come into class at any time the room is unoccupied to look at the material. I am most willing to help students who help themselves. If you can demonstrate that you have reviewed the background concepts, studied your notes, and reviewed the lab material, I will be more than happy to spend time with you. I will do whatever it takes to get you up to speed. Please feel free to stop by my office at any time; you do not need to limit yourself to my office hours.

Classroom Courtesy:

Please turn off all cell phones before class and keep them put away for the entire class period (including breaks). Refrain from using them at all times; that includes text messaging. Each time I see your phone, or hear it ring, I will deduct 20 points from your grade.

Do not use MP3 players or earphones of any kind. I also prefer you do not use laptop computers in class. They really aren't very good for taking notes, and there are too many other things to distract you.

Academic Dishonesty:

Academic dishonesty of any sort will not be tolerated. The giving or receiving of assistance on any exam or the misrepresentation of someone else's work as your own is considered cheating. Plagiarism on written assignments (including cutting and pasting from internet sources) is unacceptable. You may work together on projects, but the work you turn in should be your own. All cheating offenses will be referred to the Dean of Students. At a minimum, sanctions will result in zero points for the assignment. However, depending on the nature of the offense, I may recommend sanctions of a failing grade in the class or expulsion from the University. See the UWO Student Code of Conduct for additional information on academic dishonesty.

Projects:

Two projects are required and will be worth 50 points each. The methods to be used in each project will be covered in class. Due dates of the projects are given in the lecture/lab schedule below. My policy regarding late work is to deduct 10% of the assigned points for each calendar day an assignment is late. Thus, if a project is turned in two days late, the highest possible grade that will be given is 80% or a "B".

Additional details about each assignment will be given later in the semester.

Project 1: (50 points) Collect and preserve six different specimens from the Agaricomycotina. Three specimens should be identified to species; the remaining three should be identified to genus. Please, do not collect giant puffballs (they stink up the room). At least three different families must be represented in your collection. In addition to the book you purchase, others will be available in the lab to assist you in identification. Each specimen should be dried and accompanied by a complete description of the specimen and the substrate on which it was found.

This project will give you practice hunting mushrooms and similar fungi and also allow you to become familiar with the literature and keys to their identification.

Project 2: (50 points) Isolate and identify to order three pure cultures of fungi from different substrates. Included in the collection should be one zygomycete fungus. You will be required to turn in detailed drawings of the important characteristics, as well as a Petri plate with the living fungus.

This project will help you learn sterile technique, how to isolate and handle fungi from nature, and how to discern important microscopic characteristics of fungi.

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Lecture and Lab Schedule:

Date	Lecture	Lab
Sep. 8	<ul style="list-style-type: none"> • Introduction to the Fungi • Diversity of fungi and fungus-like organisms • Relationship to other organisms 	
Sep. 13	<ul style="list-style-type: none"> • Takehome Pretest Due • History of mycology • The fungal body and cells 	
Sep. 15	<ul style="list-style-type: none"> • Fungal physiology, nutrition, and growth • Fungal ecology: ways they make their living 	
Sep. 20	<ul style="list-style-type: none"> • Overview of Basidiomycota • Agaricomycotina, Agaricomycetes 	
Sep. 22	<ul style="list-style-type: none"> • Agaricomycetes (continued) 	
Sep. 27		<ul style="list-style-type: none"> • Agaricomycetes
Sep. 29	<ul style="list-style-type: none"> • Tremellomycetes • Pucciniomycotina 	<ul style="list-style-type: none"> • Tremellales and Auriculariales
Oct. 4	<ul style="list-style-type: none"> • Pucciniomycotina (continued) • Ustilagomycotina 	
Oct. 6		<ul style="list-style-type: none"> • Rust and smut fungi
Oct. 11	<ul style="list-style-type: none"> • Mushroom poisoning 	<ul style="list-style-type: none"> • Review for Exam
Oct. 13	EXAM 1	
Oct. 18	<ul style="list-style-type: none"> • Overview of Ascomycota • Sexual vs. asexual reproduction 	
Oct. 20	<ul style="list-style-type: none"> • Form Phylum Deuteromycota • Ontogeny of conidia • Saccardo's classification system 	<ul style="list-style-type: none"> • Video Tape: Conidial Ontogeny
Oct. 25	<ul style="list-style-type: none"> • Conidial fungi 	<ul style="list-style-type: none"> • Conidial fungi • Sterile technique; isolation and growing fungi
Oct. 27	<ul style="list-style-type: none"> • PROJECT #1 DUE • Taphrinomycotina and Saccharomycotina 	<ul style="list-style-type: none"> • Yeasts • Taphrinales
Nov. 1	<ul style="list-style-type: none"> • Pezizomycotina 	
Nov. 3		<ul style="list-style-type: none"> • Pezizomycotina
Nov. 8	<ul style="list-style-type: none"> • Review for Exam 	
Nov. 10	EXAM 2	
Nov. 15	<ul style="list-style-type: none"> • Zygomycota • Glomeromycota 	
Nov. 17		<ul style="list-style-type: none"> • Zygomycota & Glomeromycota
Nov. 22	<ul style="list-style-type: none"> • Fungi as symbionts: Lichens • Fungi as symbionts: Mycorrhizae 	<ul style="list-style-type: none"> • Lichens • Mycorrhizae
Nov. 24	<ul style="list-style-type: none"> • No class – Thanksgiving break 	
Nov. 29	<ul style="list-style-type: none"> • PROJECT #2 DUE • Chytridiomycota • Blastocladiomycota • Neocallismastigomycota 	<ul style="list-style-type: none"> • Chytridiomycota
Dec. 1	<ul style="list-style-type: none"> • Oomycota 	<ul style="list-style-type: none"> • Oomycota
Dec. 6	<ul style="list-style-type: none"> • Acrasiomycota • Dictyosteliomycota • Plasmodiophoromycota 	<ul style="list-style-type: none"> • Plasmodiophoromycota
Dec. 8	<ul style="list-style-type: none"> • Myxomycota 	<ul style="list-style-type: none"> • Plasmodial slime molds
Dec. 13	<ul style="list-style-type: none"> • Fungi as food • Medicinal uses of fungi 	<ul style="list-style-type: none"> • Review of Fungal Evolution • Review for Exam
Dec. 15	EXAM 3	