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# BIOLOGY 335/535

# MYCOLOGY

FALL 2017

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**Lectures:** 1:00-1:50 pm Mondays & Wednesdays    Science A208

**Labs:** 10:00 am – 12:40 pm Fridays    TNR 451

**Open labs:** Most Thursday evenings 7-9 pm

**Textbook:** 21<sup>st</sup> Century Guidebook to Fungi. David Moore, Geoffrey D. Robson, Anthony P.J. Trinci. Cambridge University Press. 2011.

**Lab Manual:** Available in the DUC Bookstore; required by September 8 lab.

## Required Materials

Each student should obtain a three-ringed binder to hold the lab manual and notes (lab notebook). Each student should also have some type of permanent marker for labeling lab materials (Sharpie® or other brand). For collecting specimens, you may want to purchase some wax paper or wax paper bags. Optional: Students may purchase some type of field guide for identifying mushrooms (recommended: *Peterson guide to Mushrooms* (McKnight & McKnight, available through the UC Bookstore).

## Course description

This course is a four-credit upper division course in biology. The course entails a taxonomic survey of fungi and an exploration of the relationships of fungi with other organisms, and aspects of applied mycology (such as food mycology and medical mycology). Activities will include a field trip to Schmeekle Reserve for mushroom collecting.

## Learning Objectives

- 1) To describe the structural, physiological, genetic, and growth characteristics of fungi.
- 2) To understand the principles and schemes used to classify fungi.
- 3) To appreciate the beneficial roles fungi play in biotechnology, food production, and the environment, as well as the impact of certain fungi on humans.
- 4) To learn the basic techniques used to collect, grow, observe, and identify fungi.

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## Course Components

Grades in this course are based on a baseline of **500 total points**, with an additional 50 points (optional).

**1) Lecture Examinations (300 points).** There will be two exams given during the semester as well as a final exam (December 19, 12:30-2:30 pm). Each exam is worth 100 points. The final exam will emphasize the last unit but will also depend on comprehensive understanding of material from other units. Format for the exams will be definitions, short answer, and some multiple choice.

**2) Lab Quizzes (80 points).** There will be 4 lab quizzes, 20 points each. The quizzes will involve recognition of fungal specimens and structures as well as understanding of the experiments performed. Dates are shown on the lecture/lab schedule.

**3) Laboratory reports (75 points).** During the semester, we will perform several open-ended experiments. The experiments may involve some observations or inoculations outside of regular class times. You are required to submit a lab report on three experiments of your choosing. The lab report is due approximately one week after the experiment is concluded. Each report is 25 points. The report will consist of a title, a description of objectives, descriptions of methods, results, and analysis. Reports will be submitted to D2L. A template for the lab report will be provided.

**4) Mushroom identification (25 points).** Students will also be required to collect and key out different species of mushrooms and other fleshy fungi. Each correct identification to species level is worth five points and three points will be given if it is only identified to correct genus. Incorrect, incomplete, or unsubstantiated identifications will not be counted. At least two different families must be represented. At least two must be to species level. One fleshy fungus specimen must be something other than a typical mushroom (i.e., bracket fungus, puffball, stinkhorn, etc.). A minimum of two must be of typical mushrooms. All specimens must be documented by a photograph (that you take—do not print a photo from the internet!). A reasonable number of submissions will be accepted (my discretion; do not submit 20+ reports in hopes a few will be correct). Up to 10 additional points can be earned as extra credit. Students will have access in the lab to shared resources (which must stay in the lab). PLEASE NOTE: Students are expected to work independently on identification (even if classmates have collected the same specimen).

**5) Miscellaneous assignments (20 pts).** There is also one “unknown” identification exercise in lab worth 10 points. There will be 10 points for short in-class assignments or “pop” quizzes.

**Optional Research project (50 points).** Points become part of the total possible points. Students who choose to do an optional research project must submit a written one-page proposal with objectives, experimental methods, materials needed and timeline for completion. Each student must work individually (no working in teams). The project must be pre-approved. Each student is responsible to

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preparing all materials needed for the experiment. The proposed project must have scientific rigor and yet be reasonable in scope and methodology (for example, do not propose to sequence the genome, or clone genes!) Deadline for submission: eighth week of classes. No exceptions on this deadline.

**Note:** Students taking this class for graduate credit (Biol 535) will complete an additional paper or project in consultation with me. The paper/project will be worth 50 points and will be due before the last day of classes (December 16).

## Grading scheme

The following scheme will be used for translating numerical scores into letter grades:

92% = A (460 pts)	77% = C+ (385 pts)
90% = A- (450) pts	72% = C (360 pts)
87% = B+ (435 pts)	70% = C- (350 pts)
82% = B = (410 pts)	60% = D (300 pts)
80% = B- (400 pts)	<60% = F ( $\leq$ 300 pts)

Because bonus points are offered on exams and quizzes, there will be no rounding up points to the next highest grade level.

## My philosophy on “curving exams” and “extra credit”

I do not curve exam scores for the following reasons:

- Most students understand “curving” to mean adding points to an exam to achieve a certain number of A's and B's.
- Technically, curving is designed to limit the number of students who can get an "A" to only the top 7% of the class. (the next 24% must receive a "B," the next 38% receive a "C," etc). This also means the bottom 7% *must* fail!
- Curving is only legitimate when there is a bell-shaped distribution of scores (which is rare in advanced classes or classes of small class).
- Curving really means is that your grade is based on your performance relative to peers and therefore grading standards fluctuate from test to test.
- Curving discourages students from helping each other learn because students who do achieve higher scores on tests in effect "lower" the grade of their peers.

Rather than “curving,” I employ a "mastery learning model" in which all students are expected to master the material and are evaluated according to the same standard, which doesn't change from test to test. There is no "curve" or quota for any numerical score or letter grade.

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### A few words on extra credit:

If you come to me and ask to do extra credit because your grade is not what you want it to be, here are some things to think about:

- You are struggling with the material/work I am already giving you and you want MORE?
- Are you asking me to give you something easy to do in place of something hard?
- Wouldn't you rather get help with your study habits and test-taking strategies?
- Would you have confidence in a nurse, doctor, dentist, auto mechanic (or other profession) who passed only because he/she got extra credit?

Bottom line: It is better to concentrate on your study habits and test-taking skills rather than look for an "easy fix." If you are having trouble in the course, don't wait-- GET HELP EARLY!

### **Policies on Attendance, Make-Up Exams, and Academic Integrity**

Regular attendance to lab is imperative for success in this course. There is a strong positive correlation between the amount of time a student spends in class and her/his final grade. It is expected that you will attend and be on time for all the lecture and laboratory sessions. Because of room scheduling and the preparation time involved in setting up live cultures, there are no make-up labs. Every effort will be made to save material if there is an avoidable absence due to illness or other emergency (see below), provided you notify me *in advance*. Some display materials will be available during open labs but experiments cannot be made up. Absences due to participation in academically sanctioned events such as athletic events or music competitions will be considered excused absences if written documentation is provided in advance.

Make-up exams will be permitted ONLY for unavoidable emergencies provided that you have called in advance. Acceptable excuses for missing an exam include<sup>1</sup>:

- personal injury, extreme illness or hospitalization, or that of an immediate family member (written verification needed from health care worker, parent, or residence hall representative).
- death in the immediate family (proof required).
- verifiable court appearance or jury duty.
- participation in a university-sponsored extracurricular activity (e.g., sports, music competitions, academic conferences).

If you cannot call, please have someone else call! The make-up must be scheduled to occur within two class days of the original test date (except in cases of hospitalization). The format of the make-up exam may be modified (instructor discretion).

You are encouraged to work and study with each other in order to get the most out of the laboratory experience. Lab experiments often involve working in pairs or groups. However, you are expected to work independently on examinations. Cheating will not be tolerated. If

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<sup>1</sup>The following are not considered valid excuses for missing class or exams: oversleeping, purchase of a plane ticket, leaving early for holiday break, hunting season, or family trip.

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any student is found cheating or aiding another student in cheating, I will initiate disciplinary action in accordance with section 14.04 of the UW System Administrative Code. Penalties may range from a zero on that exam to a failing grade in the course.

Standards and Disciplinary Procedures for UWSP can be found at:

<http://www.uwsp.edu/stuaffairs/Documents/RightsRespons/SRR-2010/rightsChap14.pdf>

## **Email**

UWSP students are expected to check their University e-mail regularly for information from the university and/or instructors. If you are using an e-mail account other than your campus account to contact me, be sure your full name is included in the message.

## **Electronic Devices**

Cell phones may be used with instructor permission in order to record lab observations, but should be kept on silent mode and put away when not in use. Using phones for other purposes will result in loss of the privilege to use them. Laptops will not be allowed during lecture. Studies show that the use of laptops decreases student success (Fried 2008; Mueller and Oppenheimer 2014). No other communication or musical devices are allowed in lecture or lab. Students needing a foreign language dictionary during exams may use one with permission from me.

## **Incomplete policy**

In some unavoidable emergency/special circumstances, students may petition for an incomplete grade. An incomplete will only be assigned at the discretion of Dr. Barta. Incompletes are normally given only when a limited number of assignments or tests are to be completed and they can be completed in a reasonable amount of time. Timeline for completion will be determined by me. Instead of incomplete, you may be encouraged to apply for a late withdrawal.

## **Special Accommodation Needs**

UWSP is committed to providing reasonable and appropriate accommodations to students with disabilities and temporary impairments. If you have a disability or acquire a condition during the semester where you need assistance, please contact the Disability and Assistive Technology Center on the 6<sup>th</sup> floor of Albertson Hall (library) as soon as possible. DATC can be reached at 715-346-3365 or [DATC@uwsp.edu](mailto:DATC@uwsp.edu).

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## Lab Safety

**You will be asked to read and sign a safety agreement the first day of lab.** Your signature indicates your willingness to abide by the safety policies of this university. Please be aware that no eating or drinking is allowed in the lab. Also, students are not permitted to wear open-toed or open-heeled shoes in the lab. Even in warm weather, students should also wear clothing that covers the legs to the ankles (unintentional spillage of cultures and chemicals can happen). Lab coats or aprons are not provided—you will need to provide your own if you wish to wear them.

## Emergency Response Guide

See the UWSP Emergency Management Plan at [www.uwsp.edu/rmgt](http://www.uwsp.edu/rmgt) for more details on emergency responses. In the event of a **medical emergency**, call 911 or use the nearest red emergency phone. In the event of a **tornado warning**, proceed to the lowest level interior room without windows. If there is a **fire alarm**, evacuate the building in a calm manner. Meet on away from the building on the south side near the Sundial. Notify instructor or emergency personnel of any missing individuals. In an **active shooter situation**, remember: Run/Hide/Fight in that order. Evacuate quickly if able; if trapped, hide quietly in a locked room, turn off lights, and silence cellphones. Spread out—do not cluster together. *If no other option is available*, work together to surprise and overtake the attacker. Follow directions of emergency responders and stay where you are until directed.

**You can sign up for Pointer Alerts**, an emergency communication alert system that allows UW-Stevens Point students, faculty, and staff to be additionally notified in the event of a campus emergency. The system is designed to provide information about active credible emergency situations that pose a threat and require immediate action. Go to the Risk Management page and click on "Pointer Alerts."

## Personal Emergencies.

If you anticipate receiving an important call (for reasons like family health emergency), please notify me before class. If your family needs to contact you during class in an unanticipated emergency, they should call the biology office at 715-346-4524 or Campus Protective Services, 715-346-3456 (after hours).

**Note:** This is a tentative syllabus. I reserve the right to make adjustments in the schedule, modify assignments, or amendments to this document. Changes will be announced and posted. Also, course materials may not be distributed or posted in any online format without the express permission from Dr. Barta.

## References

- Fried C (2008) In-class laptop use and its effects on student learning (2008) *Computers & Education* 50 (3): 906–914.
- Mueller PA and Oppenheimer DM (2014) The Pen Is Mightier Than the Keyboard Advantages of Longhand Over Laptop Note Taking *Psychological Science*. DOI: 10.1177/0956797614524581.

## LECTURE & LAB SCHEDULE

Date	Topic	Text
W 9/6	Course Intro; Fungi and human culture	---
<b>F 9/9 LAB</b>	<b>Intro to the Lab; The Microscope; Sampling Air and Surfaces for Fungi</b>	
M 9/11	Overview of Fungi: General characteristic	Chap. 3
W 9/13	Mushroom collection & identification	---
<b>F 9/15 LAB</b>	<b>Field trip Schmeekle Reserve</b> (meet at shelter off Maria Dr.) Note: if weather is inclement, we will switch labs with next Friday	
M 9/18	Fungal cell biology: cell structure	Chap. 5
W 9/20	Fungal cell biology, cont.	Chap. 6
<b>F 9/22 LAB</b>	<b>More Mushroom Identification (bring in specimens); Fungi in Soil</b>	
M 9/25	Fungal genetics	Chap. 7
W 9/27	Fungal genetics, cont.	Chap. 8
<b>F 9/29 LAB</b>	<b>Methods for Studying Fungi in the Lab</b>	
M 10/2	Biochemistry & Developmental Biology	Chap. 10
W 10/4	The Chytrids	(Chap. 3) + other resources
<b>F 10/6 LAB</b>	<b>Quiz #1; Chytrids; set up moist chambers for Zygomycetes &amp; inoculate plates for zygospores</b>	
M 10/9	<b>EXAM I</b>	
W 10/11	Zygomycota	(Chap. 3) + other resources
<b>F 10/13 LAB</b>	<b>Zygomycota</b>	
M 10/16	Ascomycota	(Chap. 3) + other resources
W 10/18	Ascomycota, cont.	"

<b>F 10/20 LAB</b>	<b>Ascomycota</b>	
M 10/23	Basidiomycota	(Chap. 3) + other resources
W 10/25	Basidiomycota, cont.	“
<b>F 10/27 LAB</b>	<b>Quiz #2 Basidiomycota Part I; start mushroom culturing experiment</b>	
M 10/30	Basidiomycota, cont. (rusts & smuts)	
W 11/1	Anamorphic fungi (“Deuteromycota”)	
<b>F 11/3 LAB</b>	<b>Basidiomycota part II (Rusts &amp; smuts)</b>	
M 11/6	Fungal-like organisms: Oomycetes	(Chap. 3) + other resources
W 11/8	Fungal-like organisms: slime molds	
<b>F 11/10 LAB</b>	<b>Non-True Fungi; Slime mold project</b>	(Chap. 3) + other resources
M 11/13	<b>EXAM II</b>	
W 11/15	Fungi & food	
<b>F 11/17 LAB</b>	<b>Quiz #3; Fungi and Food: Fermentation experiment; Isolation of yeast from fruit</b>	
M 11/20	Ecosystem mycology: fungi as saprotrophs	Chap. 13
W 11/22	Symbiotic associations: mycorrhizae & lichens	Chap. 13
<b>F 11/24 LAB</b>	<b>No LAB: THANKSGIVING BREAK</b>	
M 11/27	Symbiotic associations with animals	Chap. 13
W 11/29	Fungi as plant pathogens	Chap. 14



<b>F 12/1 LAB</b>	<b>Fungi and Human Health (Parts 1 &amp; 2)</b>	
M 12/4	Fungi & human health	Chap. 15
W 12/6	Fungal biotechnology	Chap. 17
<b>F 12/8 LAB</b>	<b>Fungi as Symbionts; Predaceous Fungi</b>	
M 12/11	Special Topic	
W 12/13	Review; course evaluations	
<b>F 12/15 LAB</b>	<b>Quiz #4; Wrap up &amp; Review</b>	

Note: even though there are scheduled times to work on some lab experiments, there will be need to conduct some of the work outside of class (set up or observation).

**FINAL EXAM:** Tuesday, Dec. 19, 12:10-2:30 pm.