

BIOLOGY 335/535 MYCOLOGY

FALL 2019



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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). Activities will include a field trip to Schmeekle Reserve for mushroom collecting.

Lectures: 12:00-12:50 pm Mondays & Wednesdays CBB 269

Labs: 1:00 pm – 3:50 pm Mondays CBB 120

Lab will be open for student use during other days of the week (tba).

Office hours: Monday & Wednesday 9-10 am; Tuesday & Thursday 4-5 pm; appointments always welcome.

Textbook: no required textbook

Optional reference: 21st Century Guidebook to Fungi. David Moore, Geoffrey D. Robson, Anthony P.J. Trinci. Cambridge University Press. 2011.

Lab Manual: Lab materials will be posted on Canvas course site.

Required Materials

Each student must obtain a three-ringed binder to hold the lab printouts and sketches. Students will be creating a lab notebook that will be evaluated for part of the grade in this course.

Students should also have some type of permanent marker for labeling lab materials (Sharpie® or similar type). For collecting mushroom specimens in the field, you need wax paper or wax paper bags, a small pocket-sized notebook, and a sturdy basket or bucket.

Optional: Students are encouraged to purchase some type of field guide for identifying mushrooms (recommended: *Peterson guide to Mushrooms* (McKnight & McKnight) and/or *Mushrooms of the Midwest* (Michael Kuo and Andrew S. Methven).

Course material is administered on Canvas.

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.

Grading Components

Grades in this course are based on a baseline of **490 total points**, with an additional 30 points (optional).

1) Lecture Examinations (300 points). There will be two exams given during the semester as well as a final exam (see date on schedule). 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 includes definitions, short answer, and some multiple choice.

2) Lab Practical (50 points). There will be a lab practical on the diversity portion of the course that involves recognition of fungal specimens and taxa.

3) Lab quizzes (50 points). There will be one take-home quiz (20 points) and two in-class quizzes (10 points and 20 points). The quizzes will cover aspects of what we do in lab in addition to studying the taxonomic groups. For example, the take home quiz will cover practical aspects of mushroom identification.

4) Mushroom identification (20 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.), and at least two specimens must be mushrooms in the "strict sense." All specimens must be documented by photograph (that you take—do not submit a photo from the internet!) as well as a spore print for mushrooms (also can be photographed). Submissions will be made on-line as pdf documents. A reasonable number of submissions will be accepted (my discretion; do not submit 20 reports in hopes a few will be correct). Up to 5 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). A specimen cannot be divided between two students that may collect it together. You

are encouraged to collect in Schmeekle Reserve and contribute to a diversity census being conducted.

5) Laboratory notebook (50 points). Each student will be required to create a laboratory notebook. The notebook will be collected at the end of the course for a grade. Grading will be based on completeness and accuracy, but not artistic ability. Specimens must be properly labeled. Notebooks will be collected for informal feedback during the semester. Notebooks may be used during the lab practical on fungal diversity.

6) Lab report (20 points). One lab report will be completed on a lab experiment. The lab reports will consist of an experimental question, or objective, data presented in graphical format (done in Excel and pasted into a Word document), discussion of the data, and hypothesis that can be formulated from the experiment. Instructions on the report will be posted on Canvas and discussed in class. Though data is shared, students are to write lab reports independently. Deadline is one week after completion of the experiment. A late report will receive a 10% per day deduction, unless a valid written excuse is provided.

Optional paper (20 points). Points become part of the total possible points (i.e, total becomes 510 points). Paper must be four to five (double spaced) pages on an applied topic in mycology. A minimum of five references must be used. Students who choose to do an optional paper must have their paper topic pre-approved. Deadline for submission: December 6.

Note: Students taking this class for graduate credit (Biol 535) must 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 13).

Grading scheme

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

92% = A	77% = C+
90% = A-	72% = C
87% = B+	70% = C-
82% = B =	60% = D
80% = B-	<60% = F

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:

- Curving is based on a bell-shaped distribution of scores (which is rare in advanced classes or classes of small class).
- 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 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.

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 work to do?*
- Are you asking me to give you something easy to do to get points in place of something hard?
- Wouldn't you rather get help with your study habits and test-taking strategies?
- Would you place your trust in a professional (e.g., nurse, doctor, dentist, auto mechanic, etc.) who obtained their credentials only because of 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!

Having said that, I do provide opportunities for the whole class to earn bonus points on exams, and extra assignments. The assignment will be a summary of a current topic on mycology that appears in some type of science news publication. More instructions about this assignment will be discussed in class.

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*.

The lab will be available at other times during the week for self-initiated study. Some display materials will be available during open labs but experiments cannot be made up. Absences due to participation in required military obligations (ROTC, National Guard) or academically sanctioned events such as athletic events, conferences, 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 and provide documentation in writing within five days of the absence. Acceptable excuses for missing an exam include¹:

- death in the immediate family
- Health emergency for a member of your family for whom you are responsible.
- verifiable court appearance or jury duty.
- participation in a university-sponsored extracurricular activity (e.g., sports, music competitions, academic conferences).
- ROTC or Military obligations

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 and assignments (including mushroom ID). Cheating will not be tolerated. If 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. Student academic standards and disciplinary procedures can be found at: <https://www.uwsp.edu/dos/Documents/UWSP14-Final2019.pdf>.

An academic integrity guide can be found at:
https://www.uwsp.edu/dos/Documents/2015_Aug_AcademicIntegrityBrochure.pdf

Students should refer to Dean of Students website for more information:

<https://www.uwsp.edu/dos/Pages/Student-Conduct.aspx>

Late policies:

Late assignments will receive a 10% point reduction per day unless a written excuse (and a valid reason) is provided.

¹The 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.

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 (such as playing music) will result in loss of the privilege to use them. Laptop computers will not be allowed during lecture. Studies show that the use of laptops decreases student success (Fried 2008; Mueller and Oppenheimer 2014). Students needing a foreign language dictionary during exams may use one with permission from me.

Special Accommodation Requests

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 6th floor of Albertson Hall (library) as soon as possible. DATC can be reached at 715-346-3365 or DATC@uwsp.edu.

Incomplete policy

In some unavoidable emergency/special circumstances, students may petition for an incomplete grade. 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. An incomplete will only be assigned at my discretion. Timeline for completion will be determined by me. Instead of an incomplete, you may be encouraged to apply for a late withdrawal through the dean's office.

Lab Safety

You will be asked to read and sign a safety agreement the first day of lab. *Your signature indicates your agreement 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).*

Emergency Response Guide

See the UWSP Emergency Management Plan at www.uwsp.edu/rmg† 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 outside, away from the building. Notify instructor or emergency personnel of any missing persons. 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: *I adhere to policies and standards put forward in this syllabus. However, I reserve the right to make adjustments in the schedule, and modify assignments if necessary. Changes will be announced and posted in advance. 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

		Lecture Topic	Labs
1	Wed 9/4	Course Introduction; Fungi and human culture	
2	Mon 9/9	General characteristics of Fungi	Lab Intro; Media preparation; Use of the Microscope
3	Wed 9/11	Fungal cell biology: cell structure	
4	Mon 9/16	Mushroom collection & identification	Mushroom collection fieldtrip*
5	Wed 9/18	Fungal cell structure, cont.	
6	Mon 9/23	Fungal Growth & Metabolism	Methods for isolating and studying fungi; Air and Surface sampling
7	Wed 9/25	Fungal Diversity: Chytrids	
8	Mon 9/30	Fungal Diversity: Zygomycetes	Diversity: Chytrids and Zygomycetes
9	Wed 10/2	Fungal Diversity: Ascomycota	
	Mon 10/7	EXAM 1 (lectures 1-8)	Diversity: Ascomycota part 1; Quiz 1 (10 pts)
10	Wed 10/9	Fungal Diversity: Ascomycota, cont.	
11	Mon 10/14	Fungal Diversity: Basidiomycota	Diversity: Ascomycota part 2
12	Wed 10/16	Fungal Diversity: Basidiomycota, cont.	
13	Mon 10/21	Fungal Diversity: Rusts & Smuts	Diversity: Basidiomycota part 1 Mushroom culturing
14	Wed 10/23	Fungal Diversity: Anamorphic fungi	
15	Mon 10/28	Fungal Diversity: Fungal-like organisms ("non-true" fungi) Oomycota	Diversity: Basidiomycota part 2 Rusts & Smuts
16	Wed 10/30	Fungal Diversity: Fungal-like organisms (Slime molds)	
17	Mon 11/4	EXAM 2 (Lectures 9-16)	Diversity: Fungal-like organisms
18	Wed 11/6	Fungal Genetics	
	Mon 11/11	Fungal Genetics, cont.	LAB PRACTICAL (through diversity)
19	Wed 11/13	Fungal ecology: Fungi as saprotrophs	

20	Mon 11/18	Fungi as symbionts: mycorrhizae & lichens	Fungal Ecology: Fungi in soil, predaceous fungi, fungal symbionts
21	Wed 11/20	Fungi in the soil environment	
22	Mon 11/25	Fungi and Food	Fermentation experiment
23	Wed 11/27	Fungi as Plant Pathogens	
24	Mon 12/2	Symbiotic Associations with Animals	Fungi and Food: Isolation of fungi from food
25	Wed 12/4	Fungi and Human Health	
26	Mon 12/9	Fungal Biotechnology	Complete fermentation experiment; Quiz 2 (20 pts)
27	Wed 12/11	Review, course evaluations	

*If weather is inclement, we will switch field trip to the following week.

FINAL EXAM: Monday, Dec. 16, 10:15-12:15