

Bisc 502: Mycology

University of Mississippi, Fall Semester 2014

Class schedule: Tues 1 - 3:45pm, Wed 1 – 2:50pm (Shoemaker 213)

Instructor: Dr. Jason Hoeksema (phone: 915-1275, e-mail: hoeksema@olemiss.edu)

Office hours: Tuesday 11:30 – 1:00 p.m. (Shoemaker Hall Rm. 318) and by appointment

Credits: 4 (includes lab)

Course Description

Mycology is the study of fungi. In this course, we will learn about all aspects of fungi, including their morphological and physiological characteristics, evolution and diversity, ecological functions and dynamics, identification, and importance to humans in a variety of contexts. This learning will take place through a combination of lectures, field trips to collect specimens, and laboratory time spent examining, identifying, and growing fungi.

Course Learning Outcomes

By the end of the semester, all students (undergraduate and graduate) should be able to:

- Recognize and explain the important differences between the major lineages of fungi
- Describe important events and divergences in the evolutionary history of fungi
- Identify most fleshy fungi commonly encountered in northern Mississippi to genus, using dichotomous keys and other information available in the literature
- Understand, and recognize in nature, the variety of important ecological niches occupied by fungi
- Understand the importance of fungi for humans in a variety of contexts, including agriculture, forestry, medicine, and food

In addition, through the writing of a synthetic paper, graduate students in the course will become experts on a particular lineage of fungi important to their area of graduate research, including knowledge of relevant primary literature, development of specific research questions and hypotheses, and a plan to test those hypotheses in future research.

Required Text: Mushrooms Demystified, by David Arora (1986, Ten Speed Press)

In addition to this text, supplemental readings will be assigned throughout the semester, with accompanying quizzes.

Quizzes and Exams

There will be a quiz most weeks (except on the day of the Midterm Exam), and the lowest quiz score will be dropped. Sometimes, the quiz will be on the previous week's lecture material. At other times, the quiz may cover a supplementary reading, or fungal taxonomy. In addition, there will be one Midterm Exam and one Final Exam, both of which will cover lecture material and fungal taxonomy/identification skills. The Final Exam will also cover material from the student presentations.

Presentations, papers, and blog posts

In the final week of the semester, all students will give an **oral presentation** on the fungal genus of their choice. For graduate students, the topic of the presentation will correspond to a component of a **synthetic paper** (which is **due at 5 p.m. the Friday before Thanksgiving**

break). All students are required to make **2 blog posts** about our field trips on the Oxford Natural History Club blog (<https://sites.google.com/site/oxfordnhc/>). Further details on these assignments will be provided during the semester.

Fungal collection

Over the course of the semester, students will make a collection of fungal specimens, identified to the level of genus or (ideally) species. To obtain maximum credit, the collection must contain:

1. At least 3 different members of Phylum Ascomycota (non-lichens)
2. At least 27 different members of Phylum Basidiomycota
3. No more than three species from the same genus

The specimens should be dried and kept in clearly labeled envelopes in a box, with codes including your initials and a specimen number (e.g., JDH01), corresponding to matching information slips. You must acquire all specimens for your collection yourself, rather than by trading with others in the class. ****Mycorrhizal species collected under pine that are successfully cultured on agar are worth 3 bonus (Extra Credit) points each. The collection is due by 5 p.m. on the Friday before Final Exams.**

Course Schedule

Date	Topics
August 26/27	<ul style="list-style-type: none"> • Intro to fungal ecology, evolution, & characteristics • Major fungal lineages I: Phylum Ascomycota
Sept 2/3	<ul style="list-style-type: none"> • Intro to collection and identification of fungi • Intro to using keys to ID unknown fungi
Sept 9/10	<ul style="list-style-type: none"> • Major fungal lineages II: Phylum Basidiomycota • Macroscopic characters of mushrooms (handout) • Practice using keys • Intro to culturing fungi on media
Sept 16/17	<ul style="list-style-type: none"> • Major fungal lineages III: Phyla Glomeromycota, Chytridiomycota, Microsporidia, and others • Macroscopic characters of mushrooms, continued
Sept 23/24	<ul style="list-style-type: none"> • Taxonomy review • Intro to molecular barcoding of fungi
Sept 30/Oct 1	<ul style="list-style-type: none"> • Fungal ecology I: Decomposers and plant parasites • Microscopic characters of fungi
Oct 7/8	<ul style="list-style-type: none"> • Fungal ecology II: Fungal parasites and predators of animals, and medical mycology • **Final deadline for choice of genus for papers & presentations: Submit your top 3 choices by end of class today
Oct 14/15	<ul style="list-style-type: none"> • Midterm Exam • Fungal dispersal and biogeography
Oct 21/22	<ul style="list-style-type: none"> • Fungal ecology III: Mycorrhizal and lichen symbioses • Extracting and studying secondary compounds from fungi
Oct 28/29	<ul style="list-style-type: none"> • Poisonous and invasive fungi
Nov 4/5	<ul style="list-style-type: none"> • Fungal communities: Spatial and temporal variation in composition

	and diversity
Nov 11/12	• Mycophagy, edible fungi, and fungal roles in food production
Nov 18/19	• Work on collections
Nov 25/26	• No Class – Thanksgiving Break
Dec 2/3	• Presentations & work on collections
***Thursday, December 11	• Final Exam: 12 noon

Grading/Points Breakdown

Undergraduate		Graduate	
Source	Points	Source	Points
Quizzes (8 x 10)	80	Quizzes	80
Blog posts (2 x 10)	20	Blog posts (2 x 10)	20
Midterm Exam	100	Midterm Exam	100
Final Exam	100	Final Exam	100
Presentations	100	Presentations	100
Collection	100	Collection	100
		Synthetic paper	100
Total	500	Total	600

Grading: 90%+ = A or A-, 80-89% = B(+/-), 70-79% = C(+/-), 60-69% = D, <60% = F

Field Trips

Field trips will occur almost every week, usually on Tuesday, regardless of weather, and will usually involve walking around off-trail in a variety of habitats, especially forests. So, you should be prepared for rain, sun, heat, cold, mud on your clothes and shoes and under your fingernails, ticks, chiggers, and mosquitoes! It is suggested that you come to Mycology class each day dressed in clothes and shoes or boots that you don't mind getting dirty, and bring along a rain jacket (or poncho) and rain pants, bug spray, sunscreen, snacks, and water. Additional suggested field equipment will be discussed on the first day of class.

Expectations

An upper-level course in biology requires a substantial time commitment, both in and out of the classroom. For every hour spent in class (lecture and lab), you should expect to spend at least two hours outside of class studying and preparing. Please consider this commitment carefully. You are expected to attend and be *on time* for all class periods. At the conclusion of class each day, please clean up your space and lab bench. Clean and return all equipment to its appropriate place, and discard trash in the trash containers and sharps in the sharps container.

Absences

Quizzes and exams can only be made up under special circumstances when they have been missed due to a medical or family emergency or official University activity (documentation required). If you have an emergency or official University activity that will cause you to miss a quiz or exam, it is essential that you contact me prior to the absence (as soon as you are aware of the conflict), either by e-mail or phone.

Necessary and suggested supplies and equipment

For field trips and fungal collection, it is essential that you bring to class each day a field notebook, pen or pencil, a supply of brown paper lunch bags or (ideally) small wax paper bags or a roll of wax paper for containing your fungal specimens, and a sturdy bag or basket to carry them in. Optional equipment that you would find useful includes: A sturdy knife, a hand lens or magnifying glass, and a digital camera. Additional suggestions for optional equipment will be discussed on the first day of class.

Suggestions for success

1. Take advantage of the full class time. This is a time when you have great access to class materials, the instructor, and your fellow students. Don't waste it!
2. Don't wait until the end of the semester to build up your collection. Especially the Ascomycetes can be hard to find, so keep an eye out for them during every field trip.
3. Study fungal taxonomy and identification carefully and frequently. During class, take full advantage of your time by carefully working through the keys for each specimen. When you encounter new vocabulary (which will happen frequently at first), look it up immediately. Outside of class, you should frequently study your fungal identification notes, photographs and drawings created by yourself or others, and study your mushroom field guide. A useful study tool is to alter the screensaver on your computer so that it cycles through a slideshow of photos of fungi, with or without the names visible.
4. Assigned reading and vocabulary. Read any assigned pages prior to coming to class (to prepare for the quiz), and then read your lecture notes after class. Read slowly and carefully, and look up unknown vocabulary words as soon as they are encountered. This will happen frequently, and is a necessary part of learning mycology.
5. Take notes during field trips, and review them frequently throughout the semester.
6. Ask or write down questions that arise during lecture and while reading and organizing your notes. Make sure you talk to the instructor about your questions, either during class, after class, during office hours, during an appointment, or with a study group.
7. Accommodations for disabilities. All students with disabilities, including invisible disabilities such as chronic illnesses and learning disabilities, should talk to me as soon as possible, after obtaining an official Instructor Notification form from the Office of Student Disability Services (234 Martindale, 662-915-7128, sds@olemiss.edu, www.olemiss.edu/depts/sds). Please don't wait until after an exam to talk to me. After talking with you and receiving the Instructor Notification Form, I will make every effort to accommodate these recommendations.