

Biodiversity of Macrofungi (BIOL 3530/5530)

Lecture: 11:00-1:35, M-F, BC 1202

Lab: 2:00-4:35, M-F, BC 2073

Field Trip: July 10-13 (mandatory)

Instructor: Dr. Emily Cantonwine; Office: BC 2031

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Course Description – A survey of the biology and diversity of fungi that produce mushrooms or large ascocarps, with an emphasis on identification in the laboratory. Field trips may be required.

Required Materials (unless otherwise stated):

- J.H. Petersen. 2013. The Kingdom of Fungi. Princeton University Press.
- D. Arora. 1986. Mushrooms Demystified, Second Edition. Ten Speed Press.
- Bessette, A.E., Roody, W.C., Bessette, A.R., Dunaway, D.L. 2007. Mushrooms of the Southeastern United States. Syracuse University Press. (optional)
- Digital camera (cell phone camera may be acceptable)
- Pocket knife, or similar digging tool
- Ruler (provided by instructor)
- Plastic fishing tackle box (provided by the instructor)
- Mushroom collecting basket (medium sized cardboard box acceptable replacement)
- 10X handlens (recommended)

Learning Outcomes

- Students will be able to identify mushrooms with dichotomous keys based on ecological, macroscopic and microscopic data.
- Students will be able to use mycological terminology to describe characteristics of macrofungi.
- Students will be able to predict ecological role of macrofungi based on mushroom location and genera identification.
- Students will be able to identify by sight or description a selection of edible or poisonous mushrooms.
- Students will be able to match toxins to species or physiological response in humans.
- Students will be able to group mushrooms by systematic relatedness.

Important Information

- A grade of C or higher is required in the course to count towards a biology degree.
- The last day to withdraw from the course is July 15.
- If you have need for special arrangements to complete the requirements of this course, please contact the Access Office for Students with Disabilities, and discuss this need with me.

GRADE:

Exams (2): 100 pt each*

Lab Practical: 100 pt*

Homework: 20 pt each (100pt total)

Macrofungi Collection: 100 pt

Systematics Project: 50pt

Participation: 50pt*

SCALE

A 90-100%

B 80-89.9%

C 70-79.9%

D 60-69.9%

F <60%

***Differences for 3530 students and Honor's Option &/or 5530 students. See details below.**

Assessments

Exams. There is a mid-term and final exam. All materials presented in lecture are fair game for the exam. The final exam is cumulative and will include knowledge and concepts gained from the systematics project. *Examinations will be more challenging for Honor's Option and 5530 students.

Lab Practical. An assessment of field and lab skills (those required to complete the mushroom collection project), including knowledge of vocabulary, and identification of form groups and commonly collected genera. *Lab practical will be more challenging for Honor's Option and 5530 students.

Homework. There will be five homework assignments, each worth 20 pt. Homework should be submitted to the BV dropbox by 10am the day it is due, and each student should come to class prepared to share their findings. Homework will be graded on the accuracy and completeness of the information submitted to BV and presented in class. See next page for Homework genera.

Macrofungi Collection. This project is a "team of 2" effort, with both students earning the same grade. There are two components of the macrofungi project. The first is a scavenger hunt to find one example of each form group discussed in class. A specimen is required as evidence unless the specimen is too difficult [dangerous] to collect, i.e. a shelf fungus 10' off the ground. In that case, a good field picture with one of the team members pointing to the fruiting body will be acceptable. Fruiting bodies collected for the scavenger hunt may be used in the second component of the project. The second part of the project is a traditional collection, with specimens identified to genera or species. Each team is expected to have 25 specimens in their collection. More information will be provided in lab.

Systematics Project. There are two parts to this project.

- **Individual part** – Each student will give a presentation that identifies the morphological features that are monophyletic for a genus in the Basidiomycota at the order, family, and genus levels, and then compare these features to a genus of a different form group in the same order or family, **OR** the same form group in a different order or family (comparison selections must be approved to avoid identical projects). The presentation should include photography of relevant features. Citations of photographs and primary resources must be provided on each relevant slide, with references listed on the last slide. This part of the project is worth 25 pt and will be graded on accuracy and completeness. Presentation skills will not be assessed.
- **Class part** – Students will work together to organize a selection of genera [from the Homework and Macrofungi Collections] by systematic relatedness (i.e. create a phylogenetic tree) using up-to-date resources. This part of the project is worth 25pt and will be done in class or lab.

Participation. This grade will be based on your participation (which includes your attention) during the lecture, laboratory, projects, and field trip. The following rubric will be used: *Note: participation expectations are higher for Honor's Option and 5530 students.

- On time for class, perfect attendance, and participation exceeds expectations = 50 pt
- On time for class, perfect attendance, and participation meets expectations = 45 pt
- On time for class, perfect attendance, but participation does not meet expectations, or there were problems with timeliness, or 1 absence, and participation meets expectations = 40 pt (*35pt)
- This grade decreases by 5 points for each additional absence and by 1 point for each unapproved use of a cell phone. See cell phone policy for more information.

General Rules

Attendance – Student attendance is taken into account in the participation grade. Because the material that is covered each day equals that of a week during the regular semester, all absences, excused or unexcused, will affect the participation grade. Tardiness to class or lab will also affect participation.

Lecture Notes – It is your responsibility to take notes during lecture. Students with an excused absence can see me for missed notes. Laptops are not allowed for note taking.

Access to the Lab – Students may use the lab anytime the building is open.

Food & Drink in Lecture and Lab – No food or drink is allowed in the laboratory. My policy in the lecture room is more lenient. You may consume food or drink as long as their use does not cause a disturbance. Each student is responsible to clean up after him or herself.

Student Conduct – I expect your full attention to be on the material during instruction. If this is not possible, then I expect you to be respectful of other students and myself by not being disruptive.

Cell Phone Policy – Cell phones should never be in use (i.e. checked) when course content or instructions are being discussed. This will lead to an immediate 1 pt deduction to the participation grade/event. If you hope to exceed my expectations for participation, cell phones should never be used for off-topic communications when working on projects in lab or class. Short, infrequent uses during project work (i.e. checking for texts 2x/lab period) will meet my expectations. Cell phones may be used during designated breaks without penalty to the participation grade.

Academic Integrity – I follow the Academic Honesty Policies and Procedures of the University.

Tentative schedule

Day	Lecture 11-1:35	Lecture Readings	Lab 2-4:35	Lab Readings	Homework Assignment
W	Introduction to fungi, cell biology, ecology, fruiting body forms, websites	Petersen 1-23; 34-45, 194-221	Macroscopic morphology – Collecting methods, macroscopic & chemical tests. Macrofungi collection project.	Mushroomexpert.com - Collecting for study - Describing mushrooms and keeping a journal - Determining odor and taste - Chemical reactions	HW 1 due R
R	Spore production & dispersal mechanisms, life cycles, microscopic features for diagnosis		Microscopy, microscopic structures	Mushroomexpert.com - Making spore prints - Using a microscope (all sections) - Identifying mushrooms	HW 2 due F
F	Basidiomycete classification	Petersen 102-187	Basidiomycete classification continued (LECTURE)		HW 3 due Sun
Sun	Drive to UNG		Discuss HW 3; prepare for collecting		
M	Mushroom Collection (am)		Sample processing (pm)		
T	Mushroom Collection (am)		Sample processing (pm)		
W	Mushroom Collection (am)		Return to VSU		
R	Ascomycete classification (LECTURE)	Petersen 46-83, 98-99	Collection Project		
F	Catch-up or Review		No Lab		
M	Exam 1; Systematics Project Introduced		Collection Project		
T	Systematics project help (bring primary articles!)		Collection Project		HW 4 due W
W	Edible mushrooms		Collection Project		HW 5 due R
R	Poisonous mushrooms & toxins		Collection Project		
F	Presentations of Individual part of Systematics project		Class part of systematics project		
M	Medicinal mushrooms (extra credit only); edible mushroom sampling		Macrofungi Collection due (4:35pm);		
T	Lab Practical		Exam 2 (Cumulative, including systematics project)		