

# BIOE 424 ECOLOGY OF FUNGI, Fall 2011

**Time & Place:** MW 1-4 pm, 214 PGC & 228 PBB.

**Instructor:** Dr. Cathy Cripps, office: 309 PBB, lab 109 PBB 994-5226, [ccripps@montana.edu](mailto:ccripps@montana.edu)

**Office hours:** anytime, but it is best to give a call/email first to see if I am available

**Teaching Assistant:** Ed Barge, lab PBB 109, 994-7621, [landsnorkler@gmail.com](mailto:landsnorkler@gmail.com)

This course emphasizes the important and varied roles of the higher fleshy fungi in natural and managed systems, focusing on forest habitats. Fungi are the ecological backbone of many terrestrial systems, yet their ecological roles as saprophytes, symbionts, and mycorrhizal mutualists are often minimized. Fungi are major players in carbon sequestration, nutrient recycling, and succession. They are symbionts of algae, cyanobacteria, trees, shrubs, forbs, orchids, ants, termites, beetles, and small mammals. Fungi are unique organisms that require special methods of study. Both traditional techniques and more recent molecular methods will be presented at the individual, population, community, landscape, and biome levels, along with topics on fungal conservation. This course consists of twice weekly sessions of 3 hours each for lecture, discussions, labs, and demonstrations. Field trips to nearby forests are required and to help initiate a required final project.

TEXT: Handouts, readings, web-links will be provided, there is no book for the class. Readings will be posted on D2L (Desire to Learn Website: access from MSU Homepage, on Quick Links) for you to download. *You will need a 3-ring notebook to keep all materials organized!!*

Hour 1: Lecture		Hour 2 & 3: Lab	
M Aug 29	The Fungal Lifestyle: The Mycelium!	short campus walk: fairy rings, spore prints	FUNGAL GROUPS
W Aug 31	Fungal Diversity, Spores, & Reproduction	Fungal morphology, tissue culture	
M Sept 5	NO CLASS: LABOR DAY		
W Sept 7	Basic Ecological Roles of Fungi	Tissue culture, re-isolation, projects	
M Sept 12	FIELD TRIP to Local Forest Ecosystem	Mushroom identification	
W Sept 14	Lab techniques for Mushrooms: micro structures and macromorphology, ID keys		MUTUALISMS
M Sept 19	Ecology of Saprophytic Fungi	Conks, isolation, identification	
W Sept 21	Succession of Fungi on Dung, Predator fungi	Set up Dung cultures, projects	
M Sept 26	FIELD TRIP – Ecology of Fungi	Saprophytes, parasites, symbionts	
W Sept 28	Endophytic Fungi - Dr. Gary Strobel	Isolation of Endophytes	
M Oct 3	Fungal Mutualisms: Mycorrhizal fungi	Observation of mycorrhizae	COMMUNITIES, POPULATIONS
W Oct 5	Mycorrhizal Methods in the lab: morphotypes, diversity, staining, isolation, test review & Friday?		
M Oct 10	EXAM 1	Lab Questions	
W Oct 12	Mutualisms of Fungi and Insects	Projects, Poster instruction	
M Oct 17	Mutualisms: Mammals, Truffles, and Trees	Hypogeous fungi identification by spore	
W Oct 19	Soil Fungi	Techniques for isolation of soil fungi	MORE
M Oct 24	Community Ecology of Fungi: & in soils	Analyze soil communities	
W Oct 26	Population Biology of Fungi	& projects	
M Oct 31	Molecular Techniques: Ed Barge	Molecular Tools: use of equipment, demos	
W Nov 2	Lab: Extraction of DNA from Fungal Tissue		
M Nov 7	PCR set up, run practice gel	& projects	
W Nov 9	NO CLASS: VETERAN'S DAY		
M Nov 14	Lab: PCR purification and gel run	Prep for sequencing	
W Nov 16	Ectomycorrhizal Community Ecology & molecular	& projects	
M Nov 21	Lichens: dual organisms, extreme environments	Posters turned in for editing	
W Nov 23	NO CLASS: THANKSGIVING		
M Nov 28	Biogeochemical Cycling and Fungi	Sequence results, Blast (& pitfalls), posters	
W Nov 30	Guest lecture: Erin Lonergan	Finish & print posters	
M Dec 5	Mini-poster presentations	Cook & taste session	
W Dec 7	Conservation of Fungi	Review for Exam 2	
M Dec 12	4:00-6:00 pm, EXAM 2	Lab questions	

**Grading:** 2 lecture tests (50% of grade = 200 pts), one will be given during the Final Exam period but is not cumulative. Research Project and mini-poster presentation on fungal ecology (25%= 100 pts)—grade is competitive. Laboratory activities ((25%= 100 pts).