AN INTRODUCTION TO FIELD & LABORATORY, MACRO & MICRO MUSHROOM IDENTIFICATION

Interior Alaska Urban Mycology
BIOL/NRM F195P, One credit
UAF Campus, Summer 2007

COURSE INFORMATION:

Title:	An Introduction to Field & Laboratory, Macro & Micro Mushroom Identification
Short Title:	Interior Alaska Urban Mycology
Number:	Biology F195P
Credits:	1 Sem. Hr. with P/F grading
Prerequisites:	None
Location:	University of Alaska Fairbanks Campus and Vicinity
Meeting Times:	6-9 p.m. Fri. & 9 a.m. to 5 p.m. Sat. & Sun.
Meeting Dates:	August 2008 8/8 or 8/15 Friday 6-9 p.m. 8/9 or 8/16 Saturday 9 a.m. to 5 p.m. 8/10 or 8/17 Sunday 9 a.m. to 5 p.m.

INSTRUCTOR: Dr. Gary A. Laursen, Mycologist & Course Instructor
UAF, Department of Biology and Wildlife
Tele: (907) 474-6295 E-mail: ffgal@uaf.edu
Office hours available by appointment

COURSE READINGS/MATERIAL: No obligatory text exists for this course. Many handouts are used instead. All are recommended readings. Course fee of $10 for materials and supplies.

COURSE DESCRIPTION: This course is to bring interested persons together who wish to collect, identify, prepare and/or preserve wild edible mushrooms. Shared will be a wealth of information on Interior Alaskan wild and/or edible mushrooms and associated laboratory activities directed toward identification. The course will provide available resources tot hose within the vicinity of Fairbanks as an outreach program for continuing adult education on mushroom and toadstool identification.

COURSE GOALS & STUDENT LEARNING OUTCOMES:

1. To have those interested in mycophagy become somewhat proficient at identifying, describing, labeling, and preserving wild fungi.
2. To understand the roles fungi play in differing environments of Interior Alaska.
3. To contribute to mycological research endeavors.

EVALUATION: Evaluation will be based on mandatory attendance and participation in laboratory and field settings. Assessment, in part, will be based on a singular diagnosis of student's "working" knowledge of wetland moss species, their ecology and taxonomy.

COURSE POLICIES: Students are expected to participate in all course activities.

DISABILITY SUPPORT SERVICES: The Office of Disability Services implements the Americans with Disabilities Act (ADA) and insures that UAF students have equal access to the campus and course materials. The instructor and designated TA will work with individuals as needed, through the Office of Disabilities Services (203 WHIT, 474-7043), to provide reasonable accommodation to students with disabilities. Realize, however, that this is a "field" course and all students must be prepared to meet those challenges.

COURSE SCHEDULE:

Friday

INTRODUCTIONS and ENROLLMENT, UAF 302 Bunnell
LECTURE ON MYCOPHAGY:
- Responsibilities: Who has them?
- Questions and Answers

MUSHROOMS AND TOADSTOOLS
- Taxa: phylogeny
- Morphology: structure
- Ecology: roles and a 'typical' life cycle
- Fungal Groups: common names

LABORATORY:
- Use and applications of microscopes used in mycology
- Material and slide preparations
- Chemical tests used in species identification
- Tools of the Trade for Mushroom Hunters

FIELD TRIP:
- In spirit!
- Super market mycology

Saturday

FIELD TRIP: 9-Noon. Place TBA. Foraging for edible fungi in the field.
LUNCH: (If collecting is good, we stay out; otherwise to the lab)
FIELD TRIP: 1:30-3:30. Return to UAF lab. For Fungal Foray
UAF LAB: Questions and Answers and Discharged thoughts
LECTURE FORAY: Bring in bag of goodies to stump the professionals!
LECTURE: The Morel Dilemma

Morchellaceae

False Morels: taxa, colors, toxins, symptoms & antidotes

Helvellaceae

True Morels: taxa, colors, toxins, symptoms & antidotes
The Boletes: *Boletus, Leccinum, Suillus*, & *Fuscoboletinus*

Boletaceae

EVENING LABORATORY: Optional
- Use of Field Guides
- Use of scientific literature in mycology
- Mushroom labeling, note taking, and photography

Sunday

FIELD TRIP: 9-Noon. Place TBA. Foraging for edible fungi in the field.
LUNCH: (If collecting is good, we stay out: otherwise to the lab)
FIELD TRIP: 1:30-3:30. Return to UAF Lab. For Fungal Foray
UAF LAB: Questions and Answers and Discharged thoughts
LECTURE: Roles played by fungi
- PUFFBALLS, The Stomach fungi (=Gasteromycetes)
  - *Calvatia* and *Lycoperdon*
- AGARICS, The Gilled fungi
  - **Tricholomataceae**

Flavulina, Lentinus, Pleurotus & *Tricholoma*

Agaricaceae

Agaricus

Coprinaceae

Coprinus

POLYPORES, The Poroid Bracket Wood Rotters

Polyporaceae

Polyporous, Laetiporous

WRAPUP & EVALUATION

EVENING LABORATORY: Optional

Preservations and accessioning & identification

A. Pre-Class Preparation:

a. Purchase text if interested: D. Arora's *Mushrooms Demystifies*, $40.
b. Each student will collect 40-50 species of fungi in any of two or three major Divisions within the Kingdom **Myceteae** (Fungi), excluding the **Chromista** & **Protozoa**.
c. Specimens must be labeled as to Alaskan Region (i.e. South Eastern), date collected noted, habitat (general and specific with Lat. & Long.) given, substrate, photographs taken, notes made, determination, and collector noted.
d. Specimens need to be preserved (dried) and bug free.
e.

B. Techniques used in Fungal Taxonomy-Kingdom distinctions

a. Taxonomy

i. Taxonomic groups (use of common names for groups)
ii. Diagnosing Families
iii. Major collection repositories
iv. Color standards
v. Literature-the personal library

b. The Literature

i. Field Guides: uses and limitations
ii. Keys
iii. Books
iv. Journals
v. Newsletters
vi. Personal communications

c. Sectioning material for micro-examination

i. Re-wetting vs. fresh material use
ii. Structure morphology
    1. **Spores:** ornamentation, size, chemical reaction, and deposits
    2. **Cystidia:** caulk-, cheilo-, dermato-, gloeo-, pileo-, and pleuro-
    3. **Hyphae:** cylinderic, physalomitic, globose

4. **Trama:** irregular, divergent, convergent, parallel

iii. Microtome: hand sections vs. histological preps.

d. Fungal collection, preservation, and description (Table 1)

i. Field gear-tools of the trade
ii. Spore prints and color
iii. Macroscopic descriptions
iv. Microscopic descriptions
v. Labeling
vi. Drying/preservations
vii. Collection care and maintenance
viii. Field photography
ix.

e. Chemical tests: Macro- & microscopic uses

a. KOH (3 & 5%)	tissue reviving
b. Melzer's reagent	amyloidity
c. Ethyl Alcohol (70% & 95%)	rewetting, granulations
d. Lactophenol cottonblue	hyphae in plant tissues
e. FeSO4 (10%)	tissue
f. Fe2Cl6 (10%)	tissue
g. Ferric alum (10%)	tissue
h. Ferric ammonium sulfate	granulations
i. Phloxine	hyphal wall
j. NH4OH	tissue
k. Concn. H2SO4 acid	spore differentiation in two genera
l. Sulphovanillin	cystidial
m. Sulfuric benaldehyde	gloeocystidia
n. Gum guaiac/Tannic acid	extracellular oxidases in culture

f. The Microscope (Optional)

i. Purchase, maintenance, use and care
ii. Calibration (of ocular micrometer) and critical measurements
iii. Personal scope instruction
iv. Use and limitations of the handles
v. Photomicroscopy
vi. Latin terminology

Table 1: **The Fungal Description**
Dr. G. Laursen

Genus species Authority Figure(s)_____
Synonomy (if appropriate or useful)

MACROSCOPIC DESCIRPTION includes:

Pileus	size, shape, color, texture, moisture, taste, odor and consistency disc – configuration, color margin – configuration, color cuticle – and pileus context color, texture, thickness
Lamellae	size (height, thickness, breadth, and width), shape (attachment), color, texture
Stipe	length, width, apex vs. base shape, texture, color, context, cuticle (aculopellis) feel
Color	bruising reactions (chemical)

MICROSCOPIC DESCRIPTION includes:

Spores	length, width range, shape, ornamentation, wall thickness, +/- apical pore, appendages, epicutis wall thickness, contents, chemical reactions
Basidia	size,shape, sterigmata # and length, chemical reactions, wall, contents
Cystidia	size, shape, type (origin), wall , contents, and/or their absence presence of Cheilocystidia, Pleurocystidia, Pileocystidia, Caulocystidia
Sub-Hymenium	elements
Lamellar trama	cell size, shape, arrangement, wall, contents
Pileus trama	as subhymenium and lamellar trama
Cutis	pilipellis type, thickness, element size, shape, arrangement, walls, contents (same for caulopellis)

Material Examined: Country: State/County/ District (City/Village/Community) Collector and Number (Date)

Habit and Habitat: General shape, attachment to substrate, higher or lower plant associates, substrate characters (acid, peaty,woody, etc.), locality and environmental parameter measurements typifying the mycological environment.

Observations and Discussion: Synopsis of key descriptive and distinguishing taxonomic characters; differences betweene closely allied species; occurrence (whether new to locality, state, country); suspected importance to community (i.e., decompose, mycorrhizal, etc.); phenology (time and relative abundance); and synonomy.