Fungal Diversity and Ecology IB 471 Syllabus
(4 credit hours)
Offered FA 2022 and every other FA semester thereafter

Welcome to IB 471, Fungal Diversity and Ecology. This course provides an introduction to the extraordinary diversity of fungi: from symbionts of lichens to decomposers and mycorrhizas and the pathogens of plants and animals. Since fungal taxonomy based on newly discovered phylogenetic relationships changes rapidly, the current classifications of the different groups of fungi will be discussed, but not overly emphasized during this course. Instead, we will emphasize practical skills used for fungal culturing and identification, and discuss the ecological role of fungi in communities and ecosystems. This course contains a lecture and an advanced lab that run back-to-back twice a week. As previous students have stated, this course will definitely change the way you view fungi!

Course Information

Instructor

Dr. Andrew Miller, Illinois Natural History Survey, Robert A. Evers Laboratory (Room 2003), phone: (217) 244-0439. Office hours by appointment. (amiller7@illinois.edu); Lab webpage: https://miller-mycology-lab.inhs.illinois.edu/

Prof. James Dalling, Department of Plant Biology, 149 Morrill Hall, phone (217) 244-8914. Office hours by appointment (dalling@illinois.edu); Lab webpage: publish.illinois.edu/dalling/

Teaching Assistant

Jason Karakehian, Department of Plant Biology (jasonmk3@illinois.edu), office hours by appointment

Time and Location

Mondays and Wednesdays, 1pm–4pm
Lecture & Laboratory - Room 4072, Natural History Building

Course format

There are two three-hour class periods each week. With exceptions for field trips, these consist of a mix of lecture and discussion interspersed with lab activities that take place in the same classroom and class period. As a general guide, lecture activities account for 1 hour and lab activities 2 hours of each class period. Lab activities include learning to isolate and culture fungi; identification of fungal structures and taxa representative of major fungal groups; analysis of fungal community datasets; field collecting trips. Discussions are based on reading of primary literature.

Prerequisite

For undergraduates: IB 150 and MCB 150; IB 302 or equivalent recommended; or consent of instructor. In reality, no prerequisite is required, other than your willingness to learn more about fungi.

Major Student Learning Outcomes:
By the end of the course, you should:

1) Possess significant knowledge of the principles and methods of fungal classification and identification
2) Recognize the most important fungal groups and their phylogenetic relationships
3) Know how to use fungal scientific names correctly
4) Apply your knowledge of fungal characters to effectively identify unknown fungi to family, genus and species
5) Understand the life-history and ecological role of major groups of fungi that impact

ecosystem function and species coexistence
6) Be able to understand and critique primary literature studies that examine fungal ecology
7) Have experience in working collaboratively to carry out the process of scientific inquiry

Textbooks
Text 1 (recommended): B. Kendrick. 2017. ***The Fifth Kingdom (4th Ed.)***, Focus Publishing, Newburyport, MA. (http://www.mycolog.com/fifthtoc.html)
Text 2 (recommended): J. Peterson. The Kingdom of Fungi. 2013. Princeton University Press.
Text 3 (for fun – 2021 Wainwright prize winning book on fungal ecology): M. Sheldrake. Entangled Life. 2020. Random House (https://www.amazon.com/Entangled-Life-Worlds-Change-Futures/dp/0525510311)

Moodle
Moodle is our course management system and its access is limited to students and staff associated with IB 471. To learn more about Learn@Illinois Moodle Service or to contact a Teaching & Learning with Technology (ATLAS-TLT) consultant, send an email to atlastlt@illinois.edu. For access to course, use https://learn.illinois.edu/auth/shibboleth/gateway.php.

Course calendar
Detailed information on weekly class topics, lecture notes, lab instructions, assignments and due dates are available on the moodle page.

Academic Integrity
According to the Student Code, "It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions." Please know that it is my responsibility as an instructor to uphold the academic integrity policy of the University, which can be found here:
http://studentcode.illinois.edu/article1_part4_1-401.html
For reporting academic integrity infractions, this course will follow the procedures outlined in the Student Code using the FAIR system. Note also that sharing recorded material, including lectures, discussions or other activities is forbidden, Sharing or posting it online is also forbidden.

Course Attendance policy
Students are expected to attend all lectures and labs in person. There will be a short quiz at the beginning of each lecture that covers material presented in the previous lecture or lab. An unexcused absence from class may result in the loss of quiz and discussion participation grades (potentially 30% of the grade). Attendance is recorded during the discussion section. Occasional absences from class (e.g., graduate students doing fieldwork or attending meetings) must be discussed ahead of time if accommodations are sought. Common courtesy suggests that if you plan to miss a lecture or lab, you notify the instructors beforehand. It is not possible to make up a presentation or a missed lab. If you miss a lab, be sure to contact the TA.

Disability Accommodations
To ensure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class are asked to see Dr. Miller or Dr. Dalling as soon as possible. If you have disability needs, schedule a confidential appointment at the start of the semester. Please don't wait until the final exam is upon us to express your needs. To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES,

you may visit 1207 S. Oak St., Champaign, call 333-4603, e-mail disability@illinois.edu or go to the DRES website. If you are concerned you have a disability-related condition that is impacting your academic progress, there are academic screening appointments available on campus that can help diagnosis a previously undiagnosed disability by visiting the DRES website and selecting "Sign-Up for an Academic Screening" at the bottom of the page.

Community of Care

If you come across a classmate whose behavior concerns you we encourage you to refer this behavior to the Student Assistance Center (217-333-0050 or http://odos.illinois.edu/community-of-care/referral/). Based on your report, the staff in the Student Assistance Center reaches out to students to make sure they have the support they need to be healthy and safe.

Further, we understand the impact that struggles with mental health can have on your experience at Illinois. Significant stress, strained relationships, anxiety, excessive worry, alcohol/drug problems, a loss of motivation, or problems with eating and/or sleeping can all interfere with optimal academic performance. We encourage all students to reach out to talk with someone, and we want to make sure you are aware that you can access mental health support at the Counseling Center (https://counselingcenter.illinois.edu/) or McKinley Health Center (https://mckinley.illinois.edu/). For mental health emergencies, you can call 911 or walk in to the Counseling Center, no appointment needed.

Emergency Response Plan

Emergencies can happen anywhere and at any time. It is important to take a minute to prepare for a situation in which our safety or even our lives could depend on our ability to react quickly. When we're faced with almost any kind of emergency – like severe weather or if someone is trying to hurt you – we have three options: run, hide or fight. Please review these guidelines: https://police.illinois.edu/wp-content/uploads/2017/08/syllabus-attachment.pdf

Inclusivity Statement

The effectiveness of this course is dependent upon the creation of an encouraging and safe classroom environment. Exclusionary, offensive or harmful speech (such as racism, sexism, homophobia, transphobia, etc.) will not be tolerated and in some cases subject to University harassment procedures. We are all responsible for creating a positive and safe environment that allows all students equal respect and comfort. We expect each of you to help establish and maintain an environment where you and your peers can contribute without fear of ridicule or intolerant or offensive language.

Grading

Grades will be assessed based on performance on quizzes and exams in the lecture section and a collection, lab projects and discussions/presentations in the lab section as follows:

Activity	Number	Points for each	Total points	% of final grade
Lecture quizzes	20	10	200	25%
Exams	3	100	300	37.5%
Specimen collection	1	150	150	18.75%
Lab projects	10	10	100	12.5%
Discussions/presentations	5	10	50	6.25%

There will be 23 **quizzes** given during this course with the top 20 counted towards your final grade. Quizzes will be given during the first 10 minutes of lecture so don't be late! There will be no

opportunities to make up quizzes or any additional time given for showing up late so please do not ask.

There will be three **exams** given during this course: Exam 1, Exam 2 and a Final Exam. The Final Exam is cumulative and will cover all lecture and lab material presented during this course. The Final Exam will be optional for those students with a 94% or above average at the end of the course.

All students will be required to turn in a collection of 25 **fungal specimens** and 5 cultures from the various groups (see handout). There will be 10 **lab projects** that will be graded throughout this course. There will be 4 **paper discussions** and a **presentation** on Human Pathogens given by students during this course.

FINAL GRADES

TOTAL POINTS	PERCENTAGE	GRADE
776-800	>97%	A+
736-775	>92%	A
720-735	>90%	A-
696-719	>87%	B+
656-695	>82%	B
640-655	>80%	B-
616-639	>77%	C+
576-615	>72%	C
560-575	>70%	C-
528-559	>67%	D+
496-527	>62%	D
480-495	>60%	D-
<480	<60%	F

While it may seem that there are many separate components in your final grade calculation, this is not the case! The course is fully integrative, with material learned in lecture reinforced in lab and vice versa. Lecture activities, lecture assignments and assessment quizzes are all designed to help you learn the material, and you can expect to see many of the very same questions on both lecture and lab exams. The terminology introduced at the start of the course may be bewildering to some, but these same terms are used throughout the course so by its end you're a pro in using basic mycological terminology! Objectives are presented for all lectures in the Lecture Outlines and if you can address those objectives, you will know all that you need to know to do well in the course!

Conflicts, Make-Up Exams and Absences

Make-up lecture exams are generally not given except under exceptional circumstances, such as a major injury, serious illness, or death in the immediate family. Other circumstances may also warrant a make-up exam, such as religious beliefs and observances or formal participation in scheduled activities of officially recognized groups, such as athletic teams.

If you have a conflict with any scheduled lecture exam this semester, the university requires that you inform your instructor as soon as possible, but no later than one week before the date of the scheduled exam. Additional information on class attendance, notifications, and absence letters is available in the Student Code (https://studentcode.illinois.edu/article1/part5/1-501/) and we will abide by these guidelines, so we ask that you become familiar with them. If you miss or plan to miss a lecture exam, provide Dr. Miller or Dr. Dalling with a written statement as soon as possible explaining

the reason for the absence and supply supporting evidence. If health related, a note from your health care provider, McKinley Health Center, or the Student Assistance Center in the Office of the Dean of Students is required. If the explanation is acceptable and supported, you may be able to make-up the exam within one week of the exam date, otherwise your remaining lecture exams will be prorated (that is, worth more). Be aware that absence letters do not excuse students from class or ensure that make-up work will be permitted.

Exam and drop dates

Last date for undergraduates to use optional late drop and receive a grade of W on academic transcript: October 28th

Final Exam date: TBD

Class schedule

Week	Day	Activity	Topic	responsible
Aug-22	M	Lec	Intro to Fungi	AM
	M	Lab	Care and use of microscopes	AM
	W	Lec	Intro to Basidiomycota	AM
	W	Lab	Hyphae and culture techniques	AM
	Su		Optional field trip to Richter - aquatic fungal collection and foray (weather permitting)	JD
Aug-29	M	Lec	Agaricomycetidae	AM
	M	Lab	Agaricomycetidae lab	AM
	W	Lec	Aphyllophorales 1	AM
	W	Lab	Aphyllophorales 1 lab	AM
Sep-05	M	Lec	LABOR DAY	
	M	Lab	LABOR DAY	
	W	Lec	Aphyllophorales 2	AM
	W	Lab	Aphyllophorales 2 lab	AM
Sep-12	M	Lec	FIELD TRIP to Trelease Woods	AM/JD
	M	Lab	FIELD TRIP to Trelease Woods	AM/JD
	W	Lec	Role of fungi in wood decomposition 1	JD
	W	Lab	Trelease fungal collection ids	JD
Sep-19	M	Lec	Role of fungi in wood decomposition 2	JD
	M	Lab	Analysis of Trelease fungal dataset	JD
	W	Lec	EXAM 1	
	W	Lab	Work on fungal collections and cultures	AM
Sep-26	M	Lec	Ecology of ectomycorrhizas 1	JD
	M	Lab	Ectomycorrhizas lab	JD
	W	Lec	Ecology of ectomycorrhizas 2	JD
	W	Lab	Ectomycorrhizas discussion paper	JD
Oct-03	M	Lec	Smuts	AM
	M	Lab	Plant pathogens lab	AM
	W	Lec	Rusts	AM

	W	Lab	Smuts and rusts	AM
Oct-10	M	Lec	Intro to Ascomycota	AM
	M	Lab	Prep for human pathogens presentations	AM
	W	Lec	Yeasts and Taphrina	AM
	W	Lab	Yeasts lab	AM
Oct-17	M	Lec	Eurotiomycetes	AM
	M	Lab	Eurotiomycetes lab	AM
	W	Lec	Erisyphales	AM
	W	Lab	Human pathogens student presentations	AM
Oct-24	M	Lec	Discomycetes	AM
	M	Lab	Discomycetes lab	AM
	W	Lec	Pyrenomycetes and Loculoascomycetes	AM
	W	Lab	Pyrenomycetes and Loculoascomycetes lab	AM
Oct-31	M	Lec	EXAM 2	AM/JD
	M	Lab	Work on fungal collections and cultures	AM
	W	Lec	Endophytic fungi	JD
	W	Lab	Endophytes lab	JD
Nov-07	M	Lec	Microfungi	AM
	M	Lab	Microfungi lab	AM
	W	Lec	Lichens	AM
	W	Lab	Lichens lab	AM
Nov-14	M	Lec	Glomeromycota and AM fungal ecology	AM/JD
	M	Lab	AMF lab and discussion	JD
	W	Lec	Aquatic fungi guest lecture	JD
	W	Lab	Aquatic fungi lab	JD
Nov-21			THANKSGIVING WEEK	
Nov-28	M	Lec	Invasive species and emerging pathogens	JD
	M	Lab	Chytrids and white nose (guest lecture)	JD
	W	Lec	Fungi in extreme environments (fire fungi etc)	JD
	W	Lab	lab/discussion paper	JD
Dec-05	M	Lec	Bioprospecting/pharmacological development -guest lecture	JD
	M	Lab	Bioprospecting discussion	JD
	W	Lec	Fungi for food	JD
	W	Lab	lab/banquet	JD

Discussion preparations and readings

Lab protocols and literature for in-class discussions will be posted on the moodle page no less than one week before class.