Course Syllabus: Mycology

BIOL 5823

General Information

Course Meetings:	Mondays (5:30 – 8:30 pm) Bolin Hall 209, 223
Instructor:	James Masuoka, PhD
Office:	Bolin Hall 324
Telephone:	940-397-4181
E-mail:	james.masuoka@msutexas.edu
Office Hours:	MTW 11:00 am – 12:00 pm; R 9:00 am – 11:00 am (Other times by appointment)

Course Description:

This course presents a survey of the diversity of fungi, their biology, and their roles in the environment. In the latter half, particular emphasis will be placed on medical mycology. Specific aspects of fungal biology and pathogenesis will be explored in more depth using current literature. Discussion of taxonomic and structural concepts will be supplemented by laboratory work.

Required Text:

No text is required for this course. Research and review articles will be assigned as required and made available on the course website (D2L).

Recommended / Useful Books:

Moore, D., Robson, G.D., Trinci, P.J. 2011. *21st Century Guidebook to Fungi*. New York: Cambridge University Press. ISBN: 978-0-521-18695-7
Available online.
(http://www.davidmoore.org.uk/21st_Century_Guidebook_to_Fungi_PLATINUM/)

Kendrick, W.B. **The Fifth Kingdom**. 3rd Edition. Mycologue Publishing. Available online. (http://www.mycolog.com/fifthtoc.html)

Alexopoulos, C.J., C.W. Mims, and M. Blackwell. 1996. *Introductory mycology*. 4th ed., New York: John Wiley & Sons.

Reiss, E., Shadomy, H.J., Lyon III, G.M. 2012. Fundamental Medical Mycology. Hoboken, NJ: Wiley-Blackwell. ISBN: 978-0-470-17791-4

Course Objectives:

- Describe the diversity of fungi – in terms of their physiology and adaptation to various environments, including a human host
- Describe the structures of which fungi are composed, and the function of those structures
- Describe the various roles fungi play in the environment
- Explain the mechanisms by which fungi act as pathogens and cause disease in humans
- Describe how fungal diseases are identified, treated and tracked within the population
- Identify structures within the microanatomy of various fungi
- Make and maintain a culture of a fungus
- Critically evaluate and present current research in mycology

Classroom Expectations and Policies:

- Students are expected to be prepared for lecture and lab by: 1) reading the text, lab manual and handouts prior to coming to class; 2) having paper and pen at hand
- Students are expected to arrive a few minutes early in order to mentally prepare. If late arrival is unavoidable, the student should enter the class in a manner that creates as little disruption as possible.
- Points will be deducted from assignments turned in late.
- Student Conduct: Please refer to the MSU Student Handbook: (https://mwsu.edu/Assets/documents/student-life/student-handbook-2017-18.pdf) for university policies related to student responsibilities, rights and activities. For example, see page 28 for valid grounds for an instructor drop (excessive absence, indifferent attitude, disruptive conduct, failure to meet class assignments) and page 65 for definitions of academic dishonesty that may be subject to disciplinary action (cheating, plagiarism, and collusion).
- **CELL PHONES (and other electronic devices): (READ THIS TWICE, PLEASE)** There are NO cell phones permitted to be out in this class. This class, as well as your other classes, requires your engagement, and cell phones serve to detract from that engagement. Additionally, your phone should be not only put away, but on “silent” (NOTE: vibrate is NOT silent). If your phone is out and/or in sight, you will be asked to put it away.
- **Similarly: use of laptops, tablets and other devices will not be permitted during lecture.** The ability to take good notes is a skill that university students must be able to master. Further, classroom studies have shown that taking notes by hand increases engagement in the material. Simply transcribing the lecture word-for-word is not helpful.
- Students with disabilities: It is the responsibility of the student to first contact Disability Support Services and then the instructor to determine what accommodations might be made for a disability. It will be the responsibility of the student to make arrangements to acquire notes. Any requests for accommodations must be made 2 weeks prior to the first exam.

- The professor considers this classroom to be a place where you will be treated with respect as a human being - regardless of gender, race, ethnicity, national origin, religious affiliation, sexual orientation, political beliefs, age, or ability. Additionally, diversity of thought is appreciated and encouraged, provided you can agree to disagree. Furthermore, guns or other weapons create a coercive environment that is neither safe nor conducive to learning. Therefore weapons of any kind will not be permitted in my classroom. This includes guns, concealed or otherwise, regardless of licensure. Any student bringing a weapon to class or to lab will be immediately dropped from the course. It is the professor's expectation that ALL students consider the classroom a safe environment.
- The instructor reserves the right to amend these rules as needed throughout the term.

E-mail Policy:
I will respond to e-mail during regular school hours (8:30 am – 5:00 pm M-F). I will make every effort to respond to e-mail sent during the week within 24 hours. Those sent over the weekend will be attended to on Monday.

Always include a subject line in your e-mail messages. It would be particularly helpful to include in the subject line the course number & section (*i.e.* BIOL 6003).

Attendance Policy:
Students are expected to attend all meetings of the classes in which they are enrolled. Although in general students are graded on intellectual effort and performance rather than attendance, absences may lower the student's grade where class attendance and class participation are deemed essential by the faculty member. In those classes where attendance is considered as part of the grade, the instructor should so inform students of the specifics in writing at the beginning of the semester in a syllabus or separate attendance policy statement. An instructor who has an attendance policy must keep records on a daily basis. The instructor must give the student a verbal or written warning prior to being dropped from the class. Instructor's records will stand as evidence of absences. A student with excessive absences may be dropped from a course by the instructor. Any individual faculty member or college has the authority to establish an attendance policy, providing the policy is in accordance with the General University Policies. [MSU Student Handbook, p. 27]

Absences will be excused for:

a. **Death of an immediate family member.** An immediate family member is considered to be a grandparent, parent, sibling, spouse, in-law, aunt, uncle, or child.
b. **Summons to appear in court or jury duty.** A copy of the summons is required.
c. **Call to military service.** A copy of your orders to report is required.
d. **University sponsored event.** Members of athletic teams, college bowl participants, etc. will be excused with proper notification.
e. **Debilitating illness or disability.** Illnesses will be addressed on an individual basis. If a student is affected by an illness that is not debilitating,

(*i.e.* flu, virus infection) which may result in the student missing one or more consecutive class sessions, that student will be marked as unexcused for the amount of days missed **unless a doctor's note is provided**.

ROUTINE APPOINTMENTS, medical or otherwise, AND VACATION TRAVEL ARE NOT ACCEPTABLE reasons for excused absences.

It is the responsibility of the student to obtain notes or other information covered in class during an absence.

Grading:
All exams and assignments count toward your final grade in the course and so it is important to do the best that you can on everything you turn in. If you find yourself having difficulties, please come to me for help early in the semester so that you give yourself time to improve.

This course is not graded on a traditional curve, but it is scaled to where the students are/end up. This allows for any adjustments that the instructor deems necessary. The course is worth approximately 800 points. Grade categories and equivalent percentages are as indicated: A (90-100%); B (80-89.9%); C (70-79.9%); D (60-69.9%); F (59.9% and below). Passing requires 60% of the points (unadjusted) for the course, or 480. Fractional percentages will be rounded at the end.

Assignment Summary:

Term paper:	100 points
Oral presentation:	100 points
Exam:	100 points
Journal Club:	50 points
Collection:	100 points
Participation/Safety:	50 points
Total:	500 points

Important Dates (Spring 2020):

Classes begin	January 10
MLK Day (no classes)	January 17
Spring Break (no classes)	March 14-18
Take Home Exam Due	March 19
Last day to drop with a "W"	March 21
Term Papers Due	April 11
Holiday Break (no classes)	April 14-15
Collections & Writeups Due	April 25
Classes end	April 29

Tentative Lecture/Topic Schedule

Date	Topic (Suggested Reading)*		
1/10	Introduction		
1/17	**Martin Luther King Jr. Day – No Class**		
1/24	General Characteristics		Lab: safety, tape prep, microscopy, culturing
1/31	"Zygomycetes"		Lab: slides, water stocks, frozen stocks
2/7	Ascomycetes		Lab: slides, specimens; (collection)
2/14	Basidiomycetes		Lab: slides, specimens; (collection)
2/21	"Deuteromycota"		Lab: slides, specimens; (collection)
2/28	Fungal Pathology / Antifungals; **[Exam: take home]**		Lab: collections
3/7	Journal Club 1 (JM); (Pathogenesis)		Lab: collections
3/14	**Spring Break – No Class**		
3/19	Journal Club 2; **[Exam Due]**		Lab: collections (if time)
3/26	Journal Club 3		Lab: collections (if time)
4/4	Candidiasis; (Mycotoxins)		Lab: collections
4/11	Presentations 1; **[Term Papers Due]**		Lab: collections (if time)
4/18	Presentations 2		Lab: collections (if time)
4/25	Presentations (TBD)		**[Collection & Write-Ups Due]**

Assignment Descriptions

1. Term paper & Oral Presentation: You will choose a fungal disease from the list provided (first come – first served). Your term paper will serve as a review of that disease including a discussion the etiologic agent(s), mechanism of damage, host and microbe factors involved in disease, diagnosis, treatment, etc. Additional information on paper formatting will be provided separately.

The second part of this assignment is to convert your paper into a presentation. You will have 30-35 minutes to present your topic, with 5-10 minutes for discussion and questions afterwards. This should be thought of as an independent entity (i.e. don't plan on simply reading your paper), but will develop out of your paper. You don't need two topics.

2. Informal Collection: You will need to use the information from this semester to assemble a small informal collection.

This collection will consist of **10 specimens.** Specimens can include: **1)** dried specimens of macroscopic fungi, including mushrooms, stink horns, shelf fungi, birds' nests, puffballs, lichens, slime molds, or microscopic fungi producing macroscopic symptoms (leaf spots, powdery mildews, downy mildews, rusts, smuts, etc); or **2)** cultures of yeasts or moulds.

Taxonomically, the collection should contain:

3 Basidiomycetes
3 Ascomycetes
2 Zygomycetes
2 (from any of the above categories).

Specimens that were previously classified as Deuteromycetes can be collected and included. For purposes of your collection, place them into Ascomycota or Basidiomycota based on the current taxonomy.

Organisms should be identified to genus (and species if possible). Only one specimen per genus will be accepted. Labeling information should include the following information: Your name, the genus of the specimen, species name (if known), collection location & date.

You should also include a brief description of each fungus based on <u>your</u> observations (i.e., the characters you used for making the identification), source of fungus (substrate from which it was isolated), and brief description of isolation technique. You also need to include the reference(s) used in making your identification. Cultures may be turned in any time during the semester, preferably as soon as the fungus is isolated into axenic (pure) culture.

A more detailed description of the Collection Report will be provided separately.

In addition to the collection writeup, macroscopic fungal specimens will also be reported on iNaturalist. An iNaturalist project has been set up for the class. This will allow for a

more direct contribution of your findings to the biodiversity knowledge base for the region.

3. Journal Club presentation: This segment of the course is in a journal club-type format. Each student will choose a paper on some aspect of fungal biology from the primary literature. Presentation dates will be determined during a future class period.

Responsibilities of the presenters/discussion leaders: During this time, your role is that of a teacher. In your presentation, the following should be clearly emphasized:

> **1)** What is the context of this paper? Provide enough background to give the results in the paper meaning and significance.
>
> **2)** What is the **specific** question the paper addresses? Often this is a very simple question.
>
> **3)** Describe, **figure by figure**, the results of the paper. What type of experiment is shown in the figure: A western blot? A gel shift? A northern blot? What controls are used? What does the data mean? The bulk of your time will be spent doing this. If you simply read the author's explanation of the data without walking the class through the data, this is not acceptable. One good way of approaching this section is to divide the paper into individual experiments and describe the results (figures) of each experiment. Introduce each experiment with its purpose – "To determine …"
>
> **4)** What new model of the phenomenon in question does the data suggest? Basically this means if you had to make a textbook (cartoon) figure to explain this paper, what would you draw?

When you are not presenting, you should be contributing to the class discussion. This means that you should have already read the paper before class. Thus, you should be prepared to discuss the material and ask any questions you might have.

(Adapted from S. Ulrich & A. Hatoum, BIOC 48100, Ithaca College)

4. Participation/Safety: Students are expected to actively participate in the course. This includes both the lectures and the laboratory-associated work. Participation in lecture includes preparing for lecture, asking questions, and participating in class discussions. Participation in the lab includes actively working on collections and mastering the techniques. Laboratory participation also includes following all laboratory safety guidelines and regulations.