

BIOD26H3
Fall 2020
Fungal Biology and Pathogenesis
Course outline

Instructor:

Professor Shelley Brunt

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Objectives of this course.

To provide an overview of the fungal kingdom with emphasis on the unique nature of fungal biology, the diversity of fungi and their role as important players in the ecosystem both beneficial and as pathogens of plants and animals. Students will be provided with an overview of the major beneficial roles as well as important fungal diseases that threaten plant and animal (including human) health. An appreciation of this understudied and underappreciated kingdom is critical from an ecological, agricultural, biotechnological and human health perspective. Within this context the economic implications of plant and animal pathogens to agriculture and the significance to human health will be explored. We will assess and analyze the host/symbiont and host/pathogen interaction in plants and host/pathogen interaction in animals. We will discuss the role of virulence factors and the types of treatments and prevention available for fungal infection of plants and animals. Throughout the course we will specifically address the clinical implications of fungal diseases in the immunocompromised population, a fast growing group of patients in the hospital and community setting. We will use both lecture and research paper discussions in the lecture section. Assignments will permit development of translational skills. **Each student is encouraged to ask questions, and participate in class (we are live through blackboard collaborate available through Quercus). Often times a question can lead to an interesting discussion for all students.**

BIOD26 is a lecture/seminar based course

Live On-line

- **Lectures: Wed Sept 9 until Nov 4 (eight lectures)- through blackboard collaborate –live 9 to 11 am Wednesdays they will be recorded and there will be in class work**
- **Tutorials: There will be three live tutorials on Thursdays 9 to 11 am in Sept and Oct-dates to be announced**
- **Class presentations: will start Thursday Nov 5 and run consecutively in lecture and tutorial until Dec 3 (9 presentation dates) Two students per group (generally three presentations each class, depending on enrollment). These will be presented through live blackboard collaborate meetings.**
- **Attendance in tutorials is required- important material on concept maps, oral presentations, annotated bibliographies and writing will be presented**
- **Attendance at on-line student presentations is required.**

- **Attendance for lectures is highly recommended (and we will discuss in class questions)**

There is no text for this course. The lectures come from a number of sources including primary papers, and reviews. However, the textbook used for BIOC17 (or any microbiology or immunology text or on-line text with a fungal section) will have some good background information. I will post some primary source material from which the lectures are drawn when required

Communication

I will answer emails Monday to Friday 9 to 5 pm. If I am not available on a particular day I will post an announcement. **Please use utoronto accounts for email (I will not answer emails from non-U OF T accounts) and please indicate the course in the subject heading. Please do not email through Quercus.**

- General announcements and any material needed for the course will be posted on Quercus

Formal On-line office hours for BIOD26 will follow the lecture on Wednesday from 11 to 11:45 am on Wednesdays on Blackboard collaborate

Accessibility: AccessAbility statement

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. AccessAbility Services staff (located in Rm AA142, Arts and Administration Building) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email ability@utsc.utoronto.ca. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Academic integrity/plagiarism

The University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.

Potential offences in papers and assignments include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up

sources or facts, obtaining or providing unauthorized assistance on any assignment.

On tests and exams cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

<http://www.utsc.utoronto.ca/vpdean/academic-integrity>)

Examples of plagiarism

papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

- Using or possessing unauthorized aids.
- Looking at someone else's answers during an exam or test.
- Misrepresenting your identity.

In academic work:

- Falsifying institutional documents or grades.
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see <http://www.utsc.utoronto.ca/aacc/academic-integrity>)

Use of Turnitin (plagiarism software in BIOD26

All assignments and the final take home exam will be deposited to Turnitin (plagiarism Detection software) via Quercus submission

"Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose

of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site”.

Intellectual Property (CTSI)

Recording or photographing any aspect of a university course - lecture, tutorial, seminar, lab, studio, practice session, field trip etc. – without prior approval of all involved and with written approval from the instructor is not permitted. **NO VIDEO CAPTURE OF LECTURES, TUTORIALS OR CLASS PRESENTATIONS IS ALLOWED.**

Course schedule:

Lecture: two hours of lecture on-line per week: 9 to 11am on Wednesday's

Tutorial: Thursdays on-line: 9 to 11am watch for the dates: attendance is required

Grade breakdown:

For any assignment that cannot be handed in on time: late assignments will have a 10% per day deduction- no assignment will be accepted more than 5 days late.

Self-declaration for illness:

If you are self- declaring you must fill out the Biology specific self-declaration form and submit it to myself and Jennifer Campbell within on day of the assignment due date –

- these cannot be used to get out of attendance for oral presentations- you get one absence forgiven
- cannot be used to get out of your own presentation
- cannot be used to hand in the in-class assignments late

Assignments:

- 1) Concept map for oral presentation (free hand or using free software-your choice)**
 - **Oct 2, 10 pm** **3%**
- 2) Annotated bibliography to support your oral presentation-**
 - **5 support papers for your presentation**
 - **Oct 14, 10 pm** **3%**
- 3) Deconstruction of assigned paper**

- **Nov 2 10 pm** **10%**
- 4) PowerPoint assignment**
- **Nov 13 10 pm** **7%**
 - Research a fungal pathogen of a non-human vertebrate, invertebrate, plant, Protist not covered in class and find an article **that is in the recent mainstream media from the last two years (2019/ 2020)** (i.e. in the news, electronic, paper or video). **Construct a mini talk of no more than 7 PowerPoint slides** (which must tell a story) that provides a layman explanation. The topic cannot be the same as that of your oral presentation or review. You must provide the original source of the article and find at least two primary papers that support the story you found.
- 5) Concept map for short review**
- **Nov 20 10 pm** **4%**
- 6) Annotated bibliography for short review (include all 15 references)**
- **Nov 26 10 pm** **4%**
- 7) Short Review:**
- **Dec 4 10 pm** **16%**
 - Area of research relating to fungal biology that interests you.

The written review must be based on current research and may address the topic from a molecular, clinical, agricultural, ecological or economic perspective. The topic can be related to the paper you present in your oral presentation

 - No more than 7 pages double spaced 12 pt (does not include references or figures if used)
 - Minimum of 15 primary source papers (this does not include published reviews which are not primary source papers).
 - At least 12 publications must be published in the last 3 years
 - The final section should be a suggestion of future research based on the review.
- 8) Oral presentation (work in groups of 2)- fungal biology topic of choice**
- schedule will be set by sign up** **16%**

- **4% of the oral presentation grades is for attendance and meaningful contributions through good engaging questions in all group presentations(you must contribute in a significant way to receive a grade above 2)**
- **12 percent for the presentation**
- **Required the presentation in detail of a Research paper from a peer reviewed journal that is no more than 3 years old.** This presentation will require a general introduction, presentation of data, data interpretation, conclusions and future/directions/relevance to the field of research. (Work in groups of two approx. 25 min with 5 minutes for questions)
 - Students must give an oral presentation. Use of self-declaration will not excuse students from giving an oral presentation
 - Presentation on a topic of your choice as long as it addresses a **topic in fungal biology**. It can be a pathogen interaction or a symbiotic interaction. It can be from a clinical, molecular ecological or economic perspective
 - You are given the latitude to present a topic that is of interest to you.

9) Class participation assignments due by 11:59 pm on day of class- **4%**
 Given out randomly throughout the eight weeks of lectures (must complete 80% for full credit)

10) Final exam (in final exam period). Cumulative in concepts and ideas and content presented throughout the 12 weeks of the course

33%

Format: long essay (take home exam during exam period) which will you require you to interrelate major concepts and themes of the course

11) Bonus grade

2 %

Post potential short answer question based on student mini talk assignment which could be used in an exam as part of an essay question. **Posted by Dec 4 by 11:59 pm.**

Lecture schedule (lectures will be posted prior to class).

I have given topic numbers rather than dates. More than one topic may be covered in one lecture. Most topics will be covered over more than one lecture as

the topics are very broad in nature. If I am covering a paper that relates to the topic, the paper will be posted at least four days prior to allow you time to look at the paper.

Topic 1: Introduction/ overview to the fungal Kingdom and characteristics of fungi:

- Diversity of Fungi and fungal-like organisms
- The interrelationship of fungi and other organisms, economic importance

Topic 2: Overview of plant and animal pathogens:

- Host-pathogen interactions
- role of virulence factors:
- biological control

Topic 3: Human pathogens

- Major fungal disease of humans

Topic 4 Treatment of mycoses with emphasis on human infections

- Diagnosis
- Role of immune system
- Clinical implications/resistance