

BIOD26H3
Fall 2021
Fungal Biology and Pathogenesis
Course outline

Instructor:

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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 (concentration on 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 human 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 either Microsoft teams or Zoom). Often times a question can lead to an interesting discussion for all students.**

BIOD26 is a lecture/seminar based course

Live On-line using Microsoft teams or Zoom, we will start with Teams:

- **I will provide the links prior to the class**
- **Lectures: Wed Sept 8 until Nov 3 (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 (if possible) on Thursdays 9 to 11 am in Sept and Oct-dates to be announced**
- **Class presentations: will start Thursday Nov 4 (if necessary depending on class size and run consecutively in lecture and tutorial until Dec 2 (9 presentation dates) Two students per group (generally three presentations each class, depending on enrollment). These will be presented through live Teams/Zoom presentations.**

- **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 11:30 am on Wednesdays as an extension of the lecture. I will set in person office hours on Wednesday's from 2 to 3 pm. If for some reason you can not make the times set email and we can arrange a separate time

Accessibility: AccessAbility statement

The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs.

Students with diverse learning styles and needs are welcome in this course. If you have a disability that may require accommodations, please feel free to approach me and/or the Accessibility Services* office

<https://www.utoronto.ca/ability/>

Academic integrity/plagiarism

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously.

The <https://www.academicintegrity.utoronto.ca/> outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In 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 in all relevant courses
- 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, please reach out to me. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources (for example, the [University of Toronto website on Academic Integrity](#)).

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.utoronto.ca/aacc/academic-integrity>)

Use of the University plagiarism detection tool

All assignments and the final take home exam will be evaluated using this tool (plagiarism Detection software) via Quercus submission

Normally, students will be required to submit their course essays to the University's plagiarism detection tool 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 tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the Centre for Teaching Support & Innovation web site (<https://uoft.me/pdt-faq>)."

Equity, Diversity and Inclusion

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities.

Intellectual Property

Notice of video recording and sharing (download permissible; re-use prohibited)

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session.

Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. In this course, you are permitted to download session videos and materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructor.

For questions about the recording and use of videos in which you appear, please contact your instructor.

Religious observances

The University provides reasonable accommodation of the needs of students who observe religious holy days other than those already accommodated by ordinary scheduling and statutory holidays. Students have a responsibility to alert members of the teaching staff in a timely fashion to upcoming religious observances and anticipated absences and instructors will make every reasonable effort to avoid scheduling tests, examinations or other compulsory activities at these times.

Please reach out to me as early as possible to communicate any anticipated absences related to religious observances, and to discuss any possible related implications for course work.

Family care responsibilities

The University of Toronto strives to provide a family-friendly environment. You may wish to inform me if you are a student with family responsibilities. If you are a student parent or have family responsibilities, you also may wish to visit the Family Care Office website at familycare.utoronto.ca.

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: <https://www.utsc.utoronto.ca/biosci/node/389>

If you are self- declaring you must fill out the self-declaration form via acorn. Please also inform me immediately if you have submitted the form so I can make changes to your assignment due dates

- 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 for in class work as you only need to complete 80%

Assignments (when necessary further information will be posted:

- 1) Concept map for oral presentation (free hand or using free software- your choice)**
 - Oct 18, 10 pm 3%
- 2) Annotated bibliography to support your oral presentation-**
 - 5 support papers for your oral presentation
 - Oct 25, 10 pm 3%
- 3) Deconstruction of assigned paper**
 - Nov 5 10 pm 10%
- 4) PowerPoint assignment**
 - Nov 16 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 (2020/ 2021)** (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 22 10 pm** **4%**

6) Annotated bibliography for short review (include all 15 references)

- **Nov 29 10 pm** **4%**

7) Short Review:

- **Dec 6 6 pm (note time change)** **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 10 am the day after class **3%**
 Given out randomly throughout the eight weeks of lectures (must complete 80% for full credit). This can be moved to the final exam if you opt out.

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

34%

Format: long essay (take home exam during exam period, given 48 hrs to complete) which will require you to interrelate major concepts and themes of the course

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