

BIOD29H: Pathobiology of Human Disease

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Department of Biological Sciences, UTSC
Course Syllabus
Winter 2021

Course description (the boring academic calendar version):

This course will examine human disease pathogenesis from two distinct perspectives: infectious and inherited. The first part of the course will explore human viral pathogens, their characteristics, and the pathogenesis of their associated diseases. Topics will include the pathogenesis of human retroviruses, influenza and hepatitis viruses. The latter part of the course will focus on the pathogenesis of genetically inherited disorders. Selected topics will encompass both single gene and complex multigenic disorders. The course will also include an examination of unconventional diseases such as those associated with bioterrorism agents and prion diseases. The course will follow lecture/seminar/discussion format and will require critical evaluation of primary scientific literature.

Co-requisites: BIOC10H or BIOC20H or BIOC39H

Course description (what I really want you to know):

There is so much excitement to be had in learning biology, especially, when we get to learn together about recent discoveries around the current global pandemic and think through the molecular mechanisms underlying a variety of human disorders (both genetic and infectious). That's what we'll do in this course and along the way we will learn to get better and better at dissecting primary literature articles and presenting our own thoughts and criticisms of published scientific studies. There are several assignments in this course and some of them will be "different"; for instance, we will do a career reflection exercise (with feedback and advice) as I know that many students at your stage are grappling with what lies ahead. We will create virtual outreach projects that will address a genuine need of a community partner, while also allowing you to reflect on your skills, strengths and weaknesses. Yes, the course will challenge you, but my hope is that you will rise to the challenge, discover your potential and feel inspired to learn more about biology and yourself as you move towards the end of your undergraduate tenure. Welcome to the course – I can't wait to meet you!

Time and logistics of weekly synchronous activities:

Lecture discussions and office hours: MONDAYS, 11AM -NOON weekly

We will discuss an overview of that week's course topic.

Paper discussion sessions: WEDNESDAYS, 11AM-1PM weekly

We will discuss the assigned paper each week starting in Week 3; note that in Weeks 4-12, one group will be leading the discussion session as their major presentation.

Discussion board postings: SUNDAYS & MONDAYS. Post is due before 4PM on MONDAYS weekly. This is a peer-based learning activity in which you will develop skills to dissect primary literature. Note: one group will be randomly assigned to monitor the discussion on the thread each week on Monday at noon and they will be responsible for selecting questions for the group presenting that Wednesday's paper discussion.

Alternate office hours: TUESDAYS, 1-2pm.

Teaching team:

I want to know every student in this course, and I am hopeful for some really interesting and informative conversations in the weeks ahead. Get in touch.

Instructor: Dr. Aarthi Ashok

aarthi.ashok@utoronto.ca

Your TA, Ajay, was an outstanding student in this course two years ago. He is an equally outstanding educator and will expertly support your learning this semester. Don't hesitate to contact him either.

TA: Luke Ajay David

ajay.david@mail.utoronto.ca

Online course resources:

Login and access the Quercus site for BIOD29H for Winter 2021. I know Quercus isn't all that exciting, but that doesn't mean the contents relevant to this course won't be. Check it out. Often!

The site will contain:

- The course syllabus – including a course description & schedule.
- Contact information for the instructor & TA
- Lecture outlines will be posted prior to each class.
- Links to primary literature assigned will be posted prior to each week of discussions.
- Slides from student presentations that will be study material for exams.
- Submission links for assessments.
- Important announcement regarding lectures, exams or course content – **please check this site regularly for any such announcements.**

Evaluation:

It may seem like a long list, but you will have so much fun with these (trust me ☺)! These assessments will challenge you, but they are designed to be fair and will allow you to feel a sense of pride for doing the hard work of learning.

1. Class presentations of critically evaluated primary literature = 22%

- Students will be divided into 8 groups of ~4-5 students
- Mini group presentation – Week 3; **Wednesday, January 27th** = 5%
- Full-length group presentation – **Weeks 4-12**; note your group's deadline = 14%
- Revised full-length group presentation – **Weeks 4-12**; note your group's deadline in the written feedback provided = 3%

2. In-class participation and weekly prepared questions = 8%. **Due dates: Week 2 and Weeks 4-12** (except for the week that you are presenting in) = total of 8 weeks. Weekly prepared questions must be submitted BEFORE 11AM on each relevant Wednesday's discussion session (that runs 11am-1pm).

3. Discussion board participation = 7%. **Due dates: Monday before 4pm on Weeks 4-12** (except for the week that you are presenting in)

Expectations and logistics: Each student will post comments and big picture questions on the discussion thread for each major presentation in the course. You may respond to others comment, but there need tone unique points made in each post. The discussion thread for the relevant weeks will be open all day Sunday and Monday but the deadline to post is **BEFORE 4pm each (relevant) Monday**. At around noon on Monday, I will randomly nominate one group to become the moderator of that week's discussion board thread and their job would be take a look at all the comments and questions and choose 3 questions (based on majority consensus and relevance) to pose to the presenting group. The moderating group will make that the final post on that thread before 5pm on Monday. The TA would track and score participation in the thread each week as well as send a quick email reminder to the presenting group about the questions that they should be addressing in their presentation that week on Wednesday.

There are 8 groups and so each student would be expected to participate in the discussion board threads 7 times, as they would not be required to post on the week of their own group's major presentation.

4. The timeline of the COVID-19 pandemic = 10%. **Due dates: Wednesdays before 4pm on Weeks 4&5, Weeks 8-11** (varies; note your group's due date)

As a group, you will create a short summary (2-3 single-spaced pages on a Word doc) of the main publications and scientific findings around the COVID-19 pandemic for a 2-month period that will be assigned to you (for example, Sep-Oct 2020). Your summary will consider the following 4 themes:

1. What did we know about the virus at this time?
2. What did we know about the disease and complications at this time?
3. What vaccine and drug development efforts were ongoing at this time?
4. What types of disparities in healthcare resources and disease outcomes were made evident at this time?

In addition to this paper submission, we will create a Milestones visual collaboratively. The final product will look like this infographic from the CDC: [<https://www.cdc.gov/flu/pandemic-resources/1918-commemoration/images/pandemic-flu-milestone-infographic.jpg>]



5. **Midterm test** in Week 7; **Wednesday, March 3rd, 2020 = 15%**

Will test content from Weeks 1-6 inclusive. Could include either or both of the following:

- Multiple-choice questions about material covered in the course
- Short answer/ data analysis questions on papers covered in the course

6. **Biology outreach (placement) project = 18%**

- Students will complete training sessions aimed at preparing them for the placements (online modules; details in separate information document). **Value =1%. Due date = Friday, Jan 29th.**
- Students will prepare a detailed written draft report of the workshop including specifics regarding research, planning and execution. This will be submitted to the instructor via Quercus for feedback. **Value = 5%. Due date: 5pm, Friday, Feb 12th.**
- Students will maintain a record of their professional communication with the community partner. This could be email correspondence or written summaries of meeting discussions. Such evidence must be submitted to the instructor. **Value =1%. Due date: 5pm, Monday, April 5th.**
- The course instructor and/or TA will assess the effectiveness of the student delivered placement workshop. A final version of the workshop details must also be submitted via Quercus. **Due date: 5pm, Monday, April 5th. Value =10%** (see information/rubric posted as a separate document). **Online workshops will be scheduled in March;** set after consultation with the community partner and instructor. [Please note: if the pandemic or other circumstances evolve that do not allow for the actual delivery of the workshop online, then your group will simply need to describe your plan for execution of such a workshop in the written document. We will be in communication about this.]
- Students will provide a “who did what?” document that accurately documents the contributions of each member of the team to the project. **Value = 1%. Due date: 5pm, Monday, April 5th.**
- Students will provide a reflection on this outreach experience. The course instructor will provide a template for the reflection, but students will be encouraged to maintain an ongoing record of reflections over the 12-week term. **Value = 2% total. Due date: 5pm, Monday, April 5th.**

7. **A career reflection exercise = 5%**

This is a series of activities aimed at helping you to reflect on your chosen future career.

Step 1: Watch these two videos and consider the suggestions made in them.

<https://youtu.be/veriqDHLXsw>

https://youtu.be/H91JDqeR_jg

Step 2: Complete the career planning worksheet and submit it via Quercus' submission link. **Due date = 5pm, Friday, Jan 15th**

Step 3: Ensure you attend the assigned office hours session to discuss your worksheet. **Week of Jan 18th or 25th.**

Step 4: Complete a final survey on this exercise. **Due date = 5pm, Friday, Jan 29th.**

8. Final exam during final exam period (Date & time TBA) = **15%**

Details will be provided during the term. The exam will assess your ability to critically evaluate primary literature.

Course Schedule (um, yeah, can't wait!):

Class	Date	Topic	Notes	Discussion board?
1A	Jan 11	Course introduction	Syllabus and course goals; group and topic assignments	NO
		Biology of viruses	Introduction to viruses	
1B	Jan 13	Antivirals and vaccines	Vaccines, antiviral drugs & targets	NO
		Critical reading of scientific literature	Reading and note-taking strategies, common techniques in cell & molecular biology	
2A	Jan 18	Outreach Project discussion	Q&A	NO
		Pathogenesis of positive stranded RNA viruses	Picornaviruses & Coronaviruses	
2B	Jan 20	Picornaviruses & Coronaviruses	Primary literature (learning to read critically)	
3A	Jan 25	Pathogenesis of negative stranded RNA viruses	Paramyxoviridae, Rhabdoviridae & Filoviridae	NO
3B	Jan 27	Filoviruses	Mini presentation – ALL groups	
4A	Feb 1	Pathogenesis of DNA viruses	HSV-1, HSV-2, Varicella zoster, Epstein-Barr & Cytomegalovirus	YES (Group 1 do NOT post)
4B	Feb 3	Herpes Viruses	Group 1 presentation	
5A	Feb 8	Pathogenesis of T-lymphotropic viruses	HTLV-1, 2, 3 & 4.	YES (Group 2 do NOT post)
5B	Feb 10	T-lymphotropic viruses	Group 2 presentation	
Reading Week				
6A	Feb 22	Pathogenesis of Hepatitis viruses	Hepatitis A, B, C, D & E	YES (Group 3 do NOT post)
6B	Feb 24	Hepatitis viruses	Group 3 presentation	
7A	Mar 1	Additional office hours	Midterm, outreach project discussions.	NO
7B	Mar 3	Midterm test	Weeks 1-6 inclusive	
8A	Mar 8	Biological agents of bioterrorism & warfare	Anthrax, Plague, Smallpox & viral hemorrhagic fevers	YES (Group 4 do NOT post)
8B	Mar 10	Biological agents of bioterrorism & warfare	Group 4 presentation	
9A	Mar 15	Prion disease pathogenesis	Infectious versus genetic forms	YES (Group 5 do NOT post)
9B	Mar 17	Prion disease pathogenesis	Group 5 presentation	
10A	Mar 22	Prion disease pathogenesis part II	Prion-like propagation in other diseases	YES (Group 6 do NOT post)
10B	Mar 24	Prion disease pathogenesis part II	Group 6 presentation	
11A	Mar 29	Single gene disorders 1	OI, Sickle cell anemia & Huntington's disease	YES (Group 7 do NOT post)
11B	Mar 31	Single gene disorders 1	Group 7 presentation	
12A	Apr 5	Single gene disorders II	Lysosomal storage disorders	YES (Group 8 do NOT post)
12B	Apr 7	Single gene disorders II	Group 8 presentation	

Special Notes:

What if I miss a deadline?

Deadlines are firm and designed to help you learn how to manage your time effectively.

The penalty for missing submission deadlines, weekly prepared questions, quizzes or any of the various assignment submissions is simply a loss of credit for that work – it is not always possible to offer makeup possibilities.

However, life happens and so, if there are extenuating circumstances at play, get in touch with me prior to missing any deadlines and we will discuss the issue. If you wish to use the [self-declaration of illness forms](#) or have questions about using them, please contact Jennifer Campbell (jac.campbell@utoronto.ca), in our Biology admin office. Note that if you use Acorn or e-service to declare an illness, you must also email Jennifer Campbell (jac.campbell@utoronto.ca) in order for us use the departmental verification process.

What if I miss an exam?

If you miss the midterm exam due to a medical illness, you will need to provide a UTSC medical certificate (<http://www.utoronto.ca/registrarsites/utoronto.ca.registrar/files/resource-files/UTSCmedicalcertificate.pdf>) within 48 hours of a missed exam, if you wish to be considered for a potential make up exam. Medical notes must be submitted via email to both Jennifer Campbell (jac.campbell@utoronto.ca) and myself (arathi.ashok@utoronto.ca). A single makeup midterm exam may be offered to students who provide significant evidence of extenuating circumstances/illness. Note that the structure of the makeup midterm will differ significantly from the normal midterm for the course and will likely be an oral exam or a written essay style exam, as determined by the instructor.

If you miss the final exam due to a medical illness, you need to submit a petition via the registrar's office and provide them with documentation. The course instructor is not responsible for the scheduling of missed final exams and so can't really help you with that.

What if I miss the weekly synchronous sessions?

Remember that the goal of these sessions is to ensure participatory learning; learning skills to dissect primary literature requires a group and peer context; hence these are essential. Note that participation in synchronous sessions is an important and **graded element** of this course. There is no formal makeup opportunity for missed sessions but do email me to make sure that you get the support you need to learn effectively in this course.

Important course policies:

Equity, Diversity & 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. This is especially true of our discussion board posts and online paper discussion sessions. U of T does not condone discrimination or harassment against any persons or communities. [<https://teaching.utoronto.ca/wp-content/uploads/2020/04/Creating-an-Inclusive-Online-Environment.pdf>]

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. [*Family Care Office at the University of Toronto*]

Notification of Recording of Online Course Meetings & Copyright Considerations:

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. **Do not** download, copy, or share any course or student materials or videos without the explicit permission of the instructor. For questions about the recording and use of videos in which you appear, please contact the instructor. [*Office of the Freedom of Information and Protection of Privacy at the University of Toronto*]

The unauthorised use of any form of device to audiotape, photograph, video-record or otherwise reproduce lectures, course notes or teaching materials provided by instructors is covered by the [Canadian Copyright Act](#) and is

prohibited. Students must obtain prior written consent to such recording. [*Provostial guidelines on the Appropriate Use of Information and Communication Technology*]

Accessibility Needs:

Students with diverse learning 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. [*The Centre for Teaching and Learning, UTSC*]

Academic Integrity:

[From The Centre for Teaching and Learning, UTSC]: Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensure 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 University of Toronto's *Code of Behaviour on Academic Matters* outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>). All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters and could have serious consequences for students including suspension or expulsion from the university. Important links: General info site: <https://www.academicintegrity.utoronto.ca/> FAQs about academic integrity: <https://www.utsc.utoronto.ca/vpdean/faq-0> Information Literacy: <https://www.academicintegrity.utoronto.ca/smart-strategies/information-literacy-and-academic-integrity/> Citations, Quoting and paraphrasing: <https://www.academicintegrity.utoronto.ca/smart-strategies/citations-quoting-and-paraphrasing/> Group work and sharing work with friends: <https://www.academicintegrity.utoronto.ca/smart-strategies/group-work/>

Please respect these rules and the values that the Code seeks to protect.

Turnitin (Plagiarism Detection Software):

Normally, students will be required to submit their coursework 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. [*The Centre for Teaching and Learning, UTSC*]

Here's an academic checklist to use for all assignments in this course. [*Centre for Teaching Support and Innovation*]

Course code: _____

Assignment title: _____

Instructor's name: _____

I, _____, affirm that this assignment represents entirely my own efforts.

I confirm that:

___ I have acknowledged the use of another's ideas with accurate citations.

___ If I used the words of another (e.g., author, instructor, information source), I have acknowledged this with quotation marks (or appropriate indentation) and proper citation.

___ When paraphrasing the work of others, I put the idea into my own words and did not just change a few words or rearrange the sentence structure

___ I have checked my work against my notes to be sure I have correctly referenced all direct quotes or borrowed ideas.

___ My bibliography includes only the sources used to complete this assignment.

- ___ This is the first time I have submitted this assignment (in whole or in part) for credit.
- ___ Any proofreading by another was limited to indicating areas of concern which I then corrected myself.
- ___ This is the final version of my assignment and not a draft.
- ___ I have kept my work to myself and did not share answers/content with others, unless otherwise directed by my instructor.
- ___ I understand the consequences of violating the University's Academic Integrity policies as outlined in the [Code of Behaviour on Academic Matters](#).

By submitting this form, I agree that the statements above are true. If I do not agree with the statements above, I will not submit my assignment and will consult the course instructor immediately.

Student name: _____

Signature: _____

Date: _____

Final note: These are unusual times and please know that the teaching team for BIOD29H will do what we can to support you. If you are feeling distressed, there are a variety of supports and resources available on campus. Start here: <https://safety.utoronto.ca/>