



UNIVERSITY OF
TORONTO
SCARBOROUGH

BIOC35 – Principles in Parasitology

Instructor: Adam Mott

Office: SY264

E-mail: adam.mott@utoronto.ca

Office hours: Monday 1 PM – 2 PM

Class: Thursday 9 AM – 11 AM

Please be prepared and consult the syllabus, lecture, and reading materials prior to any office hour meeting so we can maximize our time. If you need to book an appointment to meet outside of these hours please contact me by e-mail. I will respond only to emails sent from UTSC or UTORONTO e-mail accounts that include the course code in the subject.

Teaching assistant: TBD

Content warning: Part of the study of parasitology includes discussions of the disease symptoms caused in humans among other hosts. This may involve the use of images that depict human disease and suffering that some of you may find disturbing.

Course objectives: BIOC35 will introduce principles in parasitic lifestyles. There are three main goals I have in teaching this course, so at the conclusion of the term I hope that you will have:

1. **Become convinced that parasites are the most fascinating group of organisms on the planet and have gained an appreciation of their impact on human, animal, and plant health.**
2. **Learned to identify a variety of parasites, the diverse strategies that they use to effectively infect hosts, and the ways we combat these pathogens.**
3. **Improved both your ability to evaluate popular science communications and to produce effective and compelling communications of your own to engage the general public.**

We will learn about common parasite life strategies, host-parasite interactions and co-evolution, parasite immune evasion strategies, impacts on public health, treatment and prevention strategies, and a little bit of history. We will concentrate primarily on

parasites of medical and veterinary importance, but we will also discuss how the strategies and mechanisms of parasitism are shared broadly irrespective of host. I also hope to show you the amazing diversity of parasites and convince you that they are wonderful tools to better understand biology broadly.

Learning outcomes: Through the lectures, readings, and assignments you will:

- Understand the ubiquity of parasitism as a life-style, and contrast it with commensalism and mutualism.
- Correctly use scientific terminology to describe parasites and their life-cycles, host-parasite interactions, and the host response to infection.
- Identify the general strategies of immune evasion used by parasites and compare and contrast these strategies.
- Understand the public health and economic importance of these organisms, how they are controlled, and compare control methods to those used against other classes of microbes.
- Identify the unique aspects of parasite biology that present challenges for their control by hosts and human interventions, while making them excellent systems for the study of many facets of biology.
- Identify and classify a variety of parasites.
- Critically evaluate popular and primary scientific literature.
- Effectively communicate scientific principles to the general public.

Texts and readings:

As many of you will not have access to the library reserve copies of any textbook I might assign, I will not be using a textbook this year. Instead I will focus on using materials that I develop myself and a variety of available digital resources that will be posted on Quercus. There are also some older digital textbooks available through the University of Toronto library online, which we may refer to at times.

How the course will work and the topics we will cover:

As you are likely aware, this is the first year that this course is being offered, so as we go through the semester we may adjust certain aspects of the course based on your feedback and how we are meeting our learning objectives. This also means that I won't present you with a week by week topic list, since I don't know precisely how fast we will be able to cover this material.

At the start of the course we will spend some time discussing parasites in general, learning the unique aspects of their study, and mastering the vocabulary to discuss them. With that foundation, my intention is to then move through different parasites at a rate of one per week or two. In general, I will post some background information on each parasite for the start of the week that I will expect you to master before we meet together. There will be a quiz to incentivize your efforts in learning this background information that will be completed prior to our meetings on Thursday. That way we can

spend our time in 'lecture' on Thursdays briefly covering those elements and then move onto the more interesting discussion of unique features of the parasite, its biology, or ecology. Each lecture session will be broken down into multiple sections with breaks built in so we aren't online for 2 straight hours. These sessions will be available live, but also recorded versions will be made available in case you are unable to attend.

As my background is mainly in protozoan (single-celled) parasites, and as they represent the best-studied and most medically important group, we will spend much of our time on these organisms. But the course will also feature sections on arthropods (both as ectoparasites and vectors of other parasites) and parasitic worms. I hope this breadth of study will help you recognize similarities between these diverse organisms, while spending a greater time with each will allow us to learn about the cutting edge science involved in their study. No course would ever be able to cover all the fascinating parasites out there, but I will also try to include brief notes about some of the strangest and most interesting parasites (in my opinion).

Topic list

- Background and the history of parasites, neglected tropical diseases, and their study
- Arthropods as parasites and vectors of disease
- Parasitic worms including those of veterinary and agricultural importance
- Protozoan parasites and parasite control

Important notes about the course:

- Each week I will post resources and materials to Quercus that should be mastered prior to our formal class meeting on Thursday.
- These resources may include a short recorded presentation.
- After you work your way through the materials you will complete that week's quiz on Quercus, which **will only be available until the start of the lecture at 9 AM Eastern Time on Thursday.**
- The 'lecture' portion will be conducted on BB collaborate. I will have a powerpoint presentation to work through as in a traditional lecture, but I hope these sessions will be interactive. It is imperative that you complete the pre-work so you are prepared to contribute. Recordings will be made available.

Grading:

Weekly quizzes – 20%

Ten quizzes each worth 2% occurring in Weeks 2 through 11. Quizzes will be conducted on Quercus and are due before class begins each week, so I would strongly encourage you not to leave the quiz until the last minute!

Midterm exam – 25%

Composed of a combination of multiple choice, fill in the blanks, diagrams, problem solving, and short answer questions. It will be based on material covered up to the midterm date.

Date: TBA; outside of class

If you miss the midterm you must contact me within 48 hours to schedule the makeup exam. The makeup will be offered the following week only.

Final exam – 35%

Composed of multiple choice, fill in the blanks, diagrams, problem solving, short answer, and short essay questions. The final exam will be cumulative as it relates to overlapping concepts through the course, but will focus on material after the midterm date.

Date: TBA; during final exam period

Science communication fact sheet – 5%

This assignment will involve the design of a CDC-style fact sheet for a parasite that we haven't yet covered in class. This will involve learning independently about a parasite that affects human, animal, or plant health and then designing an informational resource for the general public to educate them about important aspects of the parasite. I will give you more detail and examples when we discuss the assignment in class. This assignment is designed to help you improve your science writing skills for a general audience and learn to distill technical sources into understandable language.

Date: Due by the end of Week 4.

Evaluation of popular science – 10%

I hope that one skill that all of you learn during this course is how to critically analyze scientific reporting in the popular media. Even those of you who do not ultimately pursue a career in science will benefit from being able to judge scientific issues that impact society at large. In this assignment you will choose an article or other item from the popular media that discusses parasites. You will then associate that reporting with the primary scientific literature from which it was drawn and write a report on how the authors synthesized and simplified the scientific literature for a general audience.

Date: Due by the end of Week 8.

Reflection on the impact of parasites – 5%

In this assignment you will listen to an audio presentation on the impacts of parasite burden on human populations. I will recommend some sources, though you will also be free to find your own. After listening you will find at least one article, report, or additional media source discussing the most interesting aspect of the podcast to you. The submitted assignment will be a 5 slide powerpoint presentation that will briefly summarize the podcast and the additional source that you identify. This assignment will also help you polish your science communication skills, while giving you some practice in the design of scientific talks.

Date: Due by the end of Week 12.

Optional assignment(s) – TBD

If time allows there may be very short optional assignment(s) for bonus credit. For these bonus assignments no late submissions will be accepted.

Any late assignments will be penalized 10% per day. Late assignments will only be accepted up to 7 days past the original deadline, otherwise a mark of zero will be assigned.

Course email policy:

Dr. Mott: adam.mott@utoronto.ca

- Your email message must originate from your UTSC or UTORONTO address and include the course code in the Subject line. Please include in the body of the message your full name. Otherwise the email will likely be deleted, along with spam messages.
- I will do my best to respond to email inquiries by email within 48 hours (in most instances) during the workweek (does not apply to weekends).
- If a question cannot be answered easily by email, I will send a reply to indicate that you should attend my office hours instead.

Teaching assistant:

Please contact the TA via email to schedule appointments to ask specific questions about the course schedule and content, if required. The TA will follow the same policy as above with regards to email composition and timing.

Accessibility needs:

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 as soon as possible.

AccessAbility Services staff (located in Rm SW302, Science Wing) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (phone 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:

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 University of Toronto's Code of Behaviour on Academic Matters

(<http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppjun011995.pdf>) 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:

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

On tests and exams:

1. Using or possessing unauthorized aids;
2. Looking at someone else's answers during an exam or test;
3. Misrepresenting your identity; and
4. When you knew or ought to have known you were doing it.

In academic work:

1. Falsifying institutional documents or grades;
2. Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes; and
3. When you knew or ought to have known you were doing so.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If students have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, they are expected to seek out additional information on academic integrity from their instructors or from other institutional resources.

Use of Turnitin:

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.

Recording:

This course, including your participation, may 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 recording and use of videos in which you may appear please contact your instructor.