

Course Instructor

Prof. Ina Anreiter: ina.anreiter@utoronto.ca

Office Hours

MON 12:00-13:00 or by appointment

Course Coordinator

Jennifer Campbell: jac.campbell@utoronto.ca

Teaching Assistants

Jenan Nouredine: jenan.nouredine@mail.utoronto.ca

Lab Section: PRA0001 MON 10:00-13:00

Marc Shenouda: marc.shenouda@mail.utoronto.ca

Lab Section: PRA0005 TUE 14:00-17:00

Aeen Ebrahim Amini: aeen.ebrahimamini@mail.utoronto.ca

Lab Section: PRA0003 TUE 11:00-14:00

Else Mikkelsen: else.mikkelsen@mail.utoronto.ca

Lab Section: PRA0007 WE 13:00-16:00

Nishant Singh: nishant.singh@mail.utoronto.ca

Lab Section: PRA0008 WE 13:00-16:00

Lectures

WED 9AM-11AM Online - Synchronous. Lectures will happen on Zoom (<https://utoronto.zoom.us/j/82484849695> Passcode: 361199). Lectures will be posted as pdf files by the night prior to the lecture to allow you to fill in details or refer to figures/tables/references. Lectures will be recorded and made available for 3 weeks after lecture date. **You must be available for the lecture (9am-11am) on October 7 for the midterm.**

Labs/Practicals

Practicals will be in the form of lab simulations on the Labster platform. They will be Online - Synchronous but flexible. The TA will provide support during the assigned practical time; however, you may also complete these practicals on your own time.

Textbook (required)

Genetics: From Genes to Genomes. Hartwell 7th ed. McGraw Hill.

You have the option to buy a bound print book with digital Connect access (includes eBook and exercises) or the Connect access only, without print copy. See the bookstore for either option or sign up at <https://connect.mheducation.com/class/i-a-biol-207-fall-2021> for the Connect only option.

Course Description

Genetic variation is the basis for all the wondrous diversity of life, and its study can help us to answer questions as varied as why siblings look alike, to why some people are more prone to a particular disease. In this course, we will cover the fundamentals of mutations, inheritance, and gene interactions with a focus on the techniques used to understand these phenomena.

Course Learning Outcomes

The goal of this course is to provide all students with foundational knowledge on the basic principles of inheritance and genetic applications. By the end of the course, you will be able to:

1. Discuss the significance of Mendel's laws and how they shaped genetics as we know it
2. Summarize the role of chromosomes in inheritance, and explain the importance of segregation of alleles, independent assortment, sex linkage and linkage
3. Analyze pedigree analysis to predict genetic outcomes
4. Analyze phenotypic ratios to determine parental genotypes
5. Describe mechanisms of DNA damage and replication
6. Compare current techniques and technological advances in genetic research

Course Prerequisites

BIOB11H3 or BIOB10Y3 and PSYB07H3 or STAB22H3

Evaluation Scheme & Course Assessments

Assessment	Points (/100)	Info
Midterm	25	October 6, Lectures 1-4
Weekly Question Set	5	Complete the question set for each lecture (10 sets x 0.5 pts, full points for completion)
Formal Lab Report	15	Report on analysis of hypothetical data, completed in groups of two. Details provided on October 20. Due: November 3
Labster Modules	5	Simulations to be completed weekly (6 simulations x 1 pts, lowest dropped)
Labster Assignment	15	Multi-format questions based on Labster simulations, completed in groups of three. Details provided on November 11. Due: November 18
Final Exam	35	Lectures 1-11
Extra credit	(2)	Complete the introductory survey, midterm evaluation, and the scientist spotlight assignment

Midterm (25%)

Midterm will be held during in-class time (9-11am) on October 6. Having a conflict with another class is **NOT a valid reason** to miss the midterm. The midterm will cover lectures 1-4.

Weekly Question Set (5%)

After lecture each week you will be assigned a short set of problems to complete on Quercus. They will be due at the start of the lecture the following week. You will have as many attempts as you need for correctly completing the questions.

Formal Laboratory Report (15%)

Students will be provided with hypothetical results. You will be writing a lab report based on your interpretation of the results. The details of this report will be provided on the week of **October 20** and the report will be due **November 3**.

Labster (5%)

You will be responsible for completing six Labster simulations throughout the semester. Each week a module is

due, you will have time during the laboratory practical to complete it. Each module will be due **at 1pm on the Friday** of the week it is assigned. If the module is NOT completed by the deadline, you will receive a zero for that module. Your lowest module mark will be dropped. Please see the tentative schedule below for assigned modules and due dates.

Labster Assignment (15%)

After all labster modules have been completed, you will complete an assignment based on the collective labster simulations. More details will be provided the week **November 10** and the assignment will be due **November 17**.

Final Exam (35%)

The final exam will be **cumulative** and will cover all lecture topics.

Extra credit

There will be two extra credit surveys available in Week 1 and Week 7 of the course, each will be worth 0.5pt. additionally, there will be an optional short extra credit assignment, scientist spotlights, worth 1pt extra credit.

Tentative Class Schedule

The tentative schedule for the course is shown below. Some adjustments may be made as the course progresses.

Week	Date	Class Topic	Textbook	Lab Topic
1	Sep 8	Lecture 1 Introduction, Modern Genetics, Mendel's Laws	Ch 1 & 2	NO LAB
2	Sep 15	Lecture 2 Extension of Mendel's Laws Due: Labster – Mendelian inheritance Due: Introductory Survey (extra credit)	Ch 2	Mendelian inheritance
3	Sep 22	Lecture 3 Extension of Mendel's Laws, Chromosomes, Mitosis, Meiosis Due: Labster – Medical genetics	Ch 2 & 3	Medical genetics
4	Sept 29	Lecture 4 X-linkage, Exceptions to Mendel's Laws Due: Labster – Monogenic disorders	Ch 3 & 4	Monogenic disorders
5	Oct 6	Midterm		NO LAB
6	Oct 13	Reading Week		
7	Oct 20	Lecture 5 Recombination, Mapping Genes, Linkage analysis Due: Labster – Cytogenetics	Ch 5	Cytogenetics
8	Oct 27	Lecture 6 Mutations, DNA Damage and Repair Due: Labster – Gene regulation Due: Midterm Survey (extra credit)	Ch 7	Gene regulation
9	Nov 3	Lecture 7 Ploidy, Chromosome Rearrangements Due: Formal lab report	Ch 14 & 15	NO LAB
10	Nov 10	Lecture 8 Molecular Biology and Recombinant DNA Technology Due: Labster – Gene expression unit	Ch 7 & 10	Gene expression unit

11	Nov 17	Lecture 9 DNA Technology, Genome Sequencing, and Bioinformatics Due: Labster Assignment	Ch 10 & 11	NO LAB
12	Nov 24	Lecture 10 Genomic Variation and Molecular Techniques Due: Scientist Spotlights (extra credit)	Ch 11 & 12	NO LAB
13	Dec 1	Lecture 11 Manipulating genomes and Undergraduate Professional Development	Ch 21	NO LAB

Course Communications

There are several ways to get help in this course. The first and best is through the online office hours held by Professor Anreiter and the TAs. These office hours will be held using the 'Bb Collaborate' link on the Quercus navigation bar. Questions can also be posted to the online discussion board. Please use your university email address for email communications and avoid asking content questions via email. Please allow at least 48 hours for a response to your question. Major announcements will be posted to Quercus. It is your responsibility to be aware of any announcements made in class. For help with Quercus please contact student-helpdesk@utsc.utoronto.ca or visit <https://www.utsc.utoronto.ca/projects/quercus/student-help/>

Class Discussion Etiquette

Please feel welcome to turn your video on during lecture, but it is not required. Feel free to discuss the course in the chat window, but please stay on topic and be respectful of your fellow students. This applies to both live discussions as well as discussion boards on Quercus. There will be two general discussion boards. One will be for student-to-student communication, where I will not comment. The other will be for comments and/or questions for me. I will monitor this discussion board regularly, but students are also welcome to respond to threads and answer questions. Please allow 48 hours for a response. I recommend that you regularly check the discussion board for new content to enhance your studying. Again, please respect your fellow students on these discussion boards and maintain a considerate dialogue. I expect everyone to show respect for the different backgrounds, experiences, beliefs, and values expressed by any member of this class. There will be no tolerance for behaviour or speech that violates the Code of Student Conduct (found here: <https://www.utsc.utoronto.ca/edio/policies-procedures>). Find out more about UTSC's commitment to EDI here: <https://www.utsc.utoronto.ca/edio/>.

Accessibility Accommodations

We welcome students with diverse learning styles and needs in this course. If you may require special accommodations in this class, you are encouraged to contact both the AccessAbility Services Office, and myself as soon as possible to ensure that we have time to implement any necessary accommodations. AccessAbility Services staff (located in room AA142) can be reached by phone (416-287-7560) or email (ability@utsc.utoronto.ca) and are available by appointment to assess specific needs, provide referrals, and arrange appropriate accommodations.

Academic Integrity

It is critical for all members of the scientific community, including students, to respect the value of each other's intellectual work and trust the contributions that we all make to the greater body of knowledge. As such, we must all work to protect the integrity of our community, our degrees, and our work by respecting the rules outlined in the University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>). All students in this course must abide by this code, which outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Academic dishonesty (which includes cheating, plagiarism, and the use of unauthorized assistance) is a serious offense that can lead to suspension or expulsion. Please familiarize yourself with the offenses listed under Section B of the code. If you have any questions about what constitutes a violation of the code, please get in touch with me so that we can discuss it further.

Submitting Assignments through Ouriginal

Normally, students will be required to submit their course essays to the University's plagiarism detection tool (Ouriginal) 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>).

Recording Lectures and Sharing Notes

Part of academic integrity is respecting the intellectual property of content creators/owners. You should be aware that your courses contain the intellectual property of the instructor, the TAs and possibly the University of Toronto. Students are permitted to use the recorded lectures and other materials for **personal use**. Sharing any course materials (e.g., lecture content, such as audio/visual recordings, handouts, or presentations; assignment materials, such as problem sets/solutions and exams; and other copyrighted material, such as primary literature pdfs) without the express permission of the creator/owner of those materials is a violation of intellectual property rights. Any student found violating this rule will be brought into the Office of Student Academic Integrity.

Missed Term Work Policy

If you miss term work (including term tests) due to illness you must self-declare within 48 hours via Acorn. Please note it is mandatory for you to fill in the notes field within the self-declaration tool on Acorn to specify what term work you are missing and applicable due dates to be considered. For some additional instructions on how to declare illness please review the following resource <https://help.acorn.utoronto.ca/blog/ufaq/how-do-i-declare-an-absence/>. If you are missing term work for another reason including: short-term illness under the care of a Physician or someone affiliated with Health and Wellness, disability reasons, a family death, vehicle accident, essential travel that is not vacation related, or varsity activities must e-mail the course instructor and Jennifer Campbell (jac.campbell@utoronto.ca) in advance or within 48 hours of the term work due date. Please note all documentation will be verified for authenticity by Jennifer Campbell and any accommodations (if applicable) will be determined by the course instructor. Please note that we understand that life happens and you may miss term work for valid reasons and we will help you navigate through those situations. Please remain in communication with our departmental admin office as well as your course's teaching team.

Submission of Assignments

All written assignments should be submitted **electronically** via Quercus.

Penalty for Late Assignments

Late submissions of ALL assignments are subject to a late penalty of 10% per day unless an extension has been granted by the course instructor, with no late assignments allowed after **7 calendar days**. For example, if your essay receives a grade of 85, and it was two days late, with a 10% late penalty per day, your final grade is 65. Requests for extensions will only be considered on a case-by-case basis if Prof. Anreiter is contacted by email to request the extension at least **one week prior** to the due date. Extensions will not be granted if this step is not followed.

Marking Concerns with Assignments

Any requests to have an assignment re-graded must be made in writing to your TAs **within one week** of the date the marks were posted on Quercus. To be considered, your message must clearly identify your concern, contain a detailed justification for your concern and make specific references to the relevant course material. Keep in mind that it is possible for your assignment grade to go down if the re-graded mark is lower than your original assignment grade.

Health and Wellness

Everyone experiences challenges during their university career, and now more than ever it is important to seek help if you are struggling. If you or someone you know needs someone to talk to, here are some resources you can contact:

- Your instructors or program coordinators
- Your college registrar and office of residence of student life (ORSL)
- MySSP [24/7, talk in 146 languages & text in 35 languages]: available for Apple and Android
- Good 2 Talk Student Helpline [24/7]: 1-866-925-5454
- Gerstein Centre [24/7]: 416-929-5200

English Language Support

The academic writing style is unfamiliar to most students at the beginning of their University programs. To help you master scientific texts, consider taking the free and confidential 20-minute Academic English Health Check (AEHC) (<https://www.utsc.utoronto.ca/eld/academic-english-health-check-aehc>) and using the free resources available at the English Language Development Centre to support your learning (<https://www.utsc.utoronto.ca/eld/english-languagedevelopment-support-consultations>).

Disclaimer

I reserve the right to modify this syllabus and its contents throughout the semester to better achieve course goals and/or to enhance the quality of the course in response to unexpected circumstances or student feedback. I will always endeavor to give students advance notification of any changes. These notifications will be made in class and on Quercus, with the most up-to-date version posted to Quercus.