

MGY470H1 S

Human and Molecular Genetics

Winter 2026 Syllabus

Course Meetings

MGY470H1 S

Section	Day & Time	Delivery Mode & Location
LEC0101	Tuesday, 10:00 AM - 11:00 AM	In Person: UC 161
	Thursday, 10:00 AM - 11:00 AM	In Person: UC 161

Refer to ACORN for the most up-to-date information about the location of the course meetings.

Lectures will be in-person every Tuesday and Thursday from 10am-11am in UC 161. See Quercus for tutorial details which will occur during regular lecture hours.

Course Contacts

Instructor: Mr. Ryan Marks

Email: ryan.marks@mail.utoronto.ca

Office Hours and Location: Please refer to the course page on Quercus for further information.

Additional Notes: Please include the course code in the subject line of your email for all course related communications.

Coordinator: Dr. Sagi Abelson

Email: sagi.abelson@utoronto.ca

Additional Notes: Please include the course code in the subject line of your email for all course related communications.

Instructor: Michael Wilson

Email: md.wilson@utoronto.ca

Additional Notes: Please include the course code in the subject line of your email for all course related communications.

Course Overview

Current aspects of human and molecular genetics including chromosome structure and function, inheritance of mutations and disease, the human genome and disease gene mapping, cancer genetics, mouse disease models and gene based diagnostics and therapies.

Course Learning Outcomes

By the end of the course, students will have developed an advanced understanding of the current principles and practices used in the contemporary study of human and molecular genetics and the various clinical applications of these approaches.

Prerequisites: BCH311H1/MGY311Y1 (Note: CSB349H1 is acceptable with permission of the instructor)

Corequisites: None

Exclusions: None

Recommended Preparation: None

Credit Value: 0.5

Course Materials

Recommended textbooks:

1) Genetics and Genomics in Medicine (2014). 1st Edition: Tom Strachan, Judith Goodship, Patrick Chinnery (ISBN: 9780815344803)

2) Thompson and Thompson Genetics in Medicine, 9th ed (2023)

Note:

A) The Strachan text is in the University of Toronto bookstore. Digital PDF versions of the textbook are available for sale online.

B) The Thompson and Thompson is more clinically focused than this course is but the chapters on chromosomal abnormalities and specific concepts in human genetics are quite useful. It is also edited by our colleagues at SickKids. This text is also relatively inexpensive and has an online version.

C) You are not required to buy these (they may provide additional background that you may find helpful but all content we will cover in exams comes from the lectures, assignments and required readings provided to you).

Marking Scheme

Assessment	Percent	Details	Due Date
Assignment 1: Genome Navigation	10%		2026-01-13
Assignment 2: Cancer Genetics Tutorial	5%	There will be an associated tutorial on February 10, 2026, during which you will complete the	2026-02-05

Assessment	Percent	Details	Due Date
		assignment together with the teaching assistant.	
Midterm	20%	Occurs during regular lecture hours (10am-11am). Location: MS 2170	2026-02-12
Assignment 3: Rare Disease	10%		2026-03-05
Assignment 4: Complex Disease Tutorial	10%		2026-03-19
Assignment 5: Genetic Counselling & Ethics	5%	There will be an associated tutorial (groups and room assignments TBD. rooms HS 696, MS 2394, MS 3290, SS 2112, SS 2119, UC 65) on Apr 2/2026 where you will discuss common clinical cases that genetic counsellors encounter and discuss the ethical implications of genetics in the clinic.	2026-03-26
In-Person Final Exam	40%		Final Exam Period

Course Schedule

Week	Description
Week 1 Jan 6/8	Introduction: new frontiers in human genetics Human genome I: chromosomal organization
Week 2 Jan 13/15	Human genome II: genome organization Human genome III: epigenome
Week 3 Jan 20/22	Genetic maps, polymorphism and human variation I Human genome IV: epigenome
Week 4 Jan 27/29	Genetic maps, polymorphism and human variation II Cancer Genetics I (basics) Assignment 1 Due Jan 27

Week 5 Feb 3/5	Cancer Genetics II (evolution) Cancer Genetics III (cancer Drivers)
Week 6 Feb 10/12	Tutorial - Cancer genetics Midterm
Week 7 Feb 24/26	Discovering the molecular basis of genetic disease: past, present and future Rare genetic disease I Assignment 2 Due Feb 26
Week 9 Mar 3/5	Rare genetic disease II Mutational mechanisms I: repeat expansions
Week 10 Mar 10/12	Mutational mechanisms I: repeat expansions Genome Diagnostics I
Week 11 Mar 17/19	Genome Diagnostics II Complex genetic disease I - recap gwas and post -gwas
Week 12 Mar 24/26	Complex genetic disease II - experimental follow up Modelling genetic disease - how crispr integrated into single-cell Assignment 3 Due Mar 24
Week 13 Mar 31/Apr 2	Tutorial - rare disease genetics From genes to genetic counselling – a breakout session and discussion Assignment 4 Due Apr 1 Assignment 5 Due Apr 3

Policies & Statements

Plagiarism Detection Tool

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>).

Students with Disabilities or Accommodation Requirements

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the beginning of the academic year by visiting <https://studentlife.utoronto.ca/departments/accessibility-services/>. Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition with any instructor, and your instructors will not reveal that you are registered with AS.

Academic Integrity

All suspected cases of academic dishonesty will be investigated following procedures outlined in the [Code of Behaviour on Academic Matters](https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019) (<https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019>). 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, to learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at <http://www.writing.utoronto.ca>. Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see [A&S Student Academic Integrity](https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity) (<https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity>) and the [University of Toronto Website on Academic Integrity](https://www.academicintegrity.utoronto.ca) (<https://www.academicintegrity.utoronto.ca>).

Specific Medical Circumstances

If you become ill and it affects your ability to do your academic work, consult me right away. Normally, I will ask you for documentation in support of your specific medical circumstances. This documentation can be an Absence Declaration (via ACORN) or the University's Verification of Student Illness or Injury (VOI) form. The VOI indicates the impact and severity of the illness, while protecting your privacy about the details of the nature of the illness. If you cannot submit a VOI due to limits on terms of use, you can submit a different form (like a letter from a doctor), as long as it is an original document, and it contains the same information as the VOI (including dates, academic impact, practitioner's signature, phone and registration number). For more information on the VOI, please see <http://www.illnessverification.utoronto.ca>. For information on Absence Declaration Tool for A&S students, please see <https://www.artsci.utoronto.ca/absence>. If you get a concussion, break your hand, or suffer some other acute injury, you should register with Accessibility Services as soon as possible.

Accommodation for Personal Reasons

There may be times when you are unable to complete course work on time due to non-medical reasons. If you have concerns, speak to me or to an advisor in your College Registrar's office; they can help you to decide if you want to request an extension or other forms of academic consideration. They may be able to email your instructors directly to provide a College Registrar's letter of support and connect you with other helpful resources on campus.

Quercus Info (if using)

This Course uses the University's learning management system, Quercus, to post information about the course. This includes posting readings and other materials required to complete class activities and course assignments, as well as sharing important announcements and updates. New information and resources will be posted regularly as we move through the term. To access the course website, go to the U of T Quercus log-in page at <https://q.utoronto.ca>. SPECIAL NOTE ABOUT GRADES POSTED ONLINE: Please also note that any grades posted are for your information only, so you can view and track your progress through the course. No grades are considered official, including any posted in Quercus at any point in the term, until they have been formally approved and posted on ACORN at the end of the course. Please contact me as soon as possible if you think there is an error in any grade posted on Quercus.

Mental Health and Well-Being

Your mental health is important. Throughout university life, there are many experiences that can impact your mental health and well-being. As a University of Toronto student, you can access free mental health and wellbeing services at Health & Wellness (<https://studentlife.utoronto.ca/department/health-wellness/>) such as same day counselling, brief counselling, medical care, skill-building workshops, and drop-in peer support. You can also meet with a Wellness Navigation Advisor who can connect you with other campus and community services and support. Call the mental health clinic at 416-978-8030 ext. 5 to book an appointment or visit <https://uoft.me/mentalhealthcare> to learn about the services available to you.

You can also visit your College Registrar to learn about the resources and supports available: <https://www.artsci.utoronto.ca/current/academic-advising-and-support/college-registrars-offices>

If you're in distress, you can access immediate support: <https://uoft.me/feelingdistressed>

Re-marking Policy - Timeline and Protocol

This item is listed here to remind you that A&S policy on re-mark requests for term work specifies that students have two weeks from when the work was returned to make such a request. If you want to include a re-marking policy in your syllabus, please consult Section 4.13 in the [A&S Academic Handbook](#) on re-marking protocol (<https://www.artsci.utoronto.ca/faculty-staff/teaching/academic-handbook#AssignmentsAssessmentTermWork>).

Video Recording and Sharing (Download and 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. 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 your instructor.

Religious Accommodations

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of cultural and religious traditions. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity (such as a test or in-class assignment) due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.