

Department of Biology Course Outline

SC/BIOL 4285 3.00, Human Molecular Genetics Winter 2021

Course Description

This course covers the application of genetic and molecular biological techniques to study human diseases and other related areas and discusses ethical concerns that might arise from this research

Prerequisites (strictly enforced)

Pre-requisite or corequisite: SC/BIOL 3130 3.00

Course Instructor(s) and Contact Information

Course director: Dr. Daniel Jeffery (he/him) Teaching Assistant: Richard Yuditskiy
Email: djeffery@yorku.ca
Virtual office hours: By appointment

Please use email specifically for personal questions/issues and include BIOL4285 in the subject heading. An online discussion forum will be available for course content related questions. In both cases, you can expect an answer within 1-2 business days.

Schedule

Synchronous (live) class time: Fridays 11:30am-2:30pm

*Most live classes will involve graded activities, marked for completion. When possible, asynchronous alternatives will be available on eClass, but active participation in all live sessions is highly encouraged.

Zoom links will be provided in eClass. Classes will be recorded for later viewing/review and uploaded to eClass within 48h, whenever possible (excluding breakout sessions).

Technology Requirements

Stable internet connection*
Microphone & video** capabilities
Access to Zoom and eClass

*You will not be penalized if you lose internet connection during any live graded activity

**Video will be encouraged during non-recorded breakout sessions and presentations, but will not be mandatory

Evaluation

Assessment	Grade (out of 100%)	Due Date
Activities (In-class/through eClass)	20%	Throughout term
Science Outreach Team Project	Define topic - 2% Written plan - 4% Completed product - 4%	Jan 28 (Week 3) Feb 11 (Week 5) Mar 18 (Week 9; presentations Mar 19/26 in-class)

	Revision - 25% 35% Total	Apr 12 (Week 12.5)
Peer review	10%	Feb 12 (in-class; Week 5) Mar 19-26 (in-class and after; Weeks 9-10)
Paper annotation assignment & critique	1 st paper - 5% 2 nd paper - 5% 3 rd paper & critique - 10% 20% Total	Feb 4 (Week 4) Feb 25 (Week 6) Mar 11 (Week 8)
Human disease assignment	Figure breakdown - 5% Case study - 10% 15% Total	Mar 4 (Week 7) Apr 12 (Week 12.5)
<p>Note: there will be no midterm or final exam. Visit eClass for details associated with each assessment. Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.</p>		

Important Dates

See Evaluation section above for assignment due dates

First class: Fri Jan 15

Reading week (*no class*): Feb 13-21

Drop Deadline: Fri Mar 12

In-class presentations/peer review (**attendance mandatory**): Feb 12, Mar 19 or 26

Good Friday (*no class*): Apr 2

Last class: Mon Apr 12 (make-up for Apr 2)

Course "Withdrawal" Deadline: Apr 12

See also the "Important Dates" section of the Registrar's Website <http://www.yorku.ca/yorkweb/cs.htm>

Resources

No textbook. Original and review journal articles (as well as lecture information, videos and other media) will be used to explore the current knowledge of human molecular genetics. All material will be freely accessible online or available through York Libraries.

Course material will be provided and updated on eClass as the course progresses. Assignments will also require additional research and reading of the scientific literature.

Website: The SC/BIOL 4285 eClass site will include announcements, course materials, resources and a discussion forum, and will be the main hub for submission of assignments.

Course announcements from eClass may be sent to your **YorkU email**; please check your email and eClass regularly. Issues with eClass should be directed to ithelp@yorku.ca

Learning Outcomes

Upon successful completion of this course, you should be able to:

- Investigate the scientific literature (primary articles and reviews) to answer broad questions related to human characteristics/health
- Explain the molecular/genetic basis of human diversity for various complex traits and human diseases
- Compare and contrast fundamental and clinical research strategies in human molecular genetics
- Assess current and developing treatments for complex human diseases
- Discuss and debate ethical issues related to human molecular genetics
- Clearly communicate research findings—in oral, written or multimedia formats—to various audiences
- Collaborate with peers to analyse, present and evaluate diverse projects in human molecular genetics

Course Content

In this course we're going to learn about **complex human traits and diseases**: what we know so far about the genetics and molecular biology for **how they work**, what we as scientists are doing now to **study** them—and **alter/treat** them—and the **ethics** behind it all.

We're going to do this by **reading papers**, **analyzing** them, **discussing** and **debating** the issues, and ultimately **synthesizing** and **presenting** our findings in various ways. And all of this will be very much led by the topics **you** are most interested in! My role will be to help **guide you** through that process, but you will also be working collaboratively with your **peers** to give each other support and feedback throughout the term. By the end of the course, you will have the skills, knowledge and confidence to take any question or idea you or someone else might have about human molecular genetics and go independently into the available literature to give a solid answer as to just how much we know about it (even if it's something completely new that we didn't cover in the course)!

This is going to take a lot of **active participation** on your part, in and outside of class time. Your **active engagement** will make up a significant part of your grade through "Activities" that will be marked mostly for completion throughout the term. These will include several discussions/debates (verbal or written) with peers, of potentially sensitive issues involving real-world problems/data related to human molecular genetics, so it's essential that the class remains a welcoming, **open** and **respectful** environment for everyone. That will be our shared responsibility.

You no doubt noticed that there are **no exams** for the course; that is because the learning outcomes I built the course around can't easily be assessed by standard testing methods. Instead, you will be doing three main assignments throughout the term, scaffolded to break down the tasks into manageable chunks and to give you feedback that you can apply to the next task. The major assignment will require you to work in a **team** to present a science outreach project with a topic, target audience, and medium **of your choosing**. This will be further supported by **peer review**.

Some examples of topics could include, but are not limited to:

- Cancer genetics, epigenetics
- Covid-19, HIV/AIDS, muscular dystrophy, Parkinson's disease, schizophrenia
- Gene editing, CRISPR-based technologies
- Genetics of obesity, race, gender, aging
- Drug & vaccine development, molecular mechanisms, placebos
- Bulk & single-cell genomics, transcriptomics, proteomics, epigenomics
- Clinical trials, preclinical & fundamental research

Experiential Education and E-Learning

Experiential learning: this course will involve extensive discussion/debate surrounding complex real-world issues, reflection, teamwork & peer review, skill development in scientific literacy, analysis of case studies, and a major science outreach communication project

E-learning: this course will be delivered entirely online. Notably, students will learn specific strategies and practice using online tools for finding, accessing, annotating and citing scientific literature.

Other Information

TurnItIn: In this course you may be asked to submit electronic copies of written work (e.g., article critique) first to TurnItIn and then to Crowdmark. This is to ensure that your hard work, having been added to the database, can't be plagiarized in the future by students at any university. You can opt out of TurnItIn—more information is available on eClass.

You do NOT have the right to post ANY course materials, including your papers and assignments, to any websites nor to sell them, without explicit written permission from the course instructor. See the note in University Policies below.

Course Policies

Session recordings (audio and/or video): Synchronous sessions in this course, including your participation, will be recorded and will be available to students in the course for viewing remotely after each session. As per the University policies below, **do not share any course or student materials or videos** without the explicit written permission from me and any students involved in their production. For questions or concerns about recording and use of videos in which you appear, please contact me.

Scheduling Conflicts: Assignment due dates are not negotiable. They have been structured to distribute your workload over the term and are timed to coordinate with the synchronous session activities, including peer review, and to allow timely formative feedback applicable for later assignments. Valid scheduling conflicts must be brought to my attention at least two weeks prior so that alternative arrangements can be made.

Team Project: You will be held accountable for your role within your group for the team project and will sign a team charter (contract). The project has scaffolded mini-assignments for which time is provided in class, due throughout the term, which will count towards your team project mark or your Activities mark. See eClass for full assignment details.

Late Assignments: Assignments requiring peer review (Science Outreach “written plan” and “completed product”) **MUST** be submitted & presented on the assigned date or you will receive a zero and you will not receive feedback *on that portion of the assignment*. The other portions of the assignment will not be affected. All other assignments can be submitted up to 3 days after the due date, *but will have 10% deducted per day*. Thereafter, you will receive a zero. This is not negotiable. However, I recognize that fluke problems may happen when you are trying to submit your files online, so you will be allowed to hand in up to two assignments (that don’t require peer review) up to 24 hours late *without* penalty.

Remarking of Assignments: Any graded work may be submitted for re-grading within 5 business days of the work being returned (made available) to the student. The work must be accompanied by a written rationale providing valid, empirical reasons for the request for reappraisal; requests because ‘My mark isn’t high enough’ will be denied. **Note: remarking can result in the mark being raised, confirmed, or lowered.**

Discussion of Marks/Grades: To be fair and consistent, individual grades are not negotiable. Grades are not “curved” (adjusted). Contact me about marks **ONLY** if there is a clear error in your mark (calculation, etc.) as soon as possible. There are no alternative assignments that can be completed for students to increase marks (e.g., extra credit).

Discussion Forum Code of Conduct: You’re encouraged to participate in the online forums; indeed forum posting may be required for some assignments, including the team project. Postings on the discussion forum should be politely worded and courteous. Discussions about topics can be engaging, but at no time should individuals take ‘shots’ at other individuals. It’s okay to disagree with another student’s position, but it is not okay to make personal attacks. Please title topic threads with relevant key words such that others may easily discern the content. The moderator (me) may remove inappropriate posts. Post only material relevant to the course (i.e., human molecular genetics related). If posts give indications of violation of academic honesty or the Student Code of Conduct (<https://oscr.students.yorku.ca/csrr>), further action will be taken.

University Policies

Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards. There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students’ research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

Important

A note from the Faculty of Science Committee on Examinations and Academic Standards:

Numerous students in Faculty of Science courses have been charged with academic misconduct when materials they uploaded to third party repository sites (e.g. Course Hero, One Class, etc.) were taken and used by unknown students in later offerings of the course. The Faculty's Committee on Examinations and Academic Standards (CEAS) found in these cases that the burden of proof in a charge of aiding and abetting had been met, since the uploading students had been found in all cases to be wilfully blind to the reasonable likelihood of supporting plagiarism in this manner. Accordingly, to avoid this risk, students are urged not to upload their work to these sites. Whenever a student submits work obtained through Course Hero or One Class, the submitting student will be charged with plagiarism and the **uploading student will be charged with aiding and abetting**.

Note also that exams, tests, and other assignments are the copyrighted works of the professor assigning them, whether copyright is overtly claimed or not (i.e. whether the © is used or not). Scanning these documents constitutes copying, which is a breach of Canadian copyright law, and the breach is aggravated when scans are shared or uploaded to third party repository sites.

Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <https://www.glendon.yorku.ca/counselling/>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete and submit an [Examination Accommodation Form](#) at least 3 weeks before the exam period begins. The form can be obtained from Student Client Services, Student Services Centre or online at http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-and-or-harassing-behaviour-in-academic-situations-senate-policy/>

Acknowledgements

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