Department of Biology Course Outline

SC/BIOL 2040 3.00 Genetics
Winter 2018

Course Description

A study of the organization and behaviour of genes and chromosomes and their roles in cells, organisms, populations and evolution. Three lecture hours, one (mandatory) tutorial hour.

Prerequisites **(strictly enforced)**

Both SC/BIOL 1000 3.00 & SC/BIOL 1001 3.00, or SC/BIOL 1010 6.00. Course credit exclusion: SC/BIOL 2040 4.00.

Course Instructors and Contact Information

Course Instructor: Dr. Arthur Hilliker biol2040@yorku.ca (Location of office hours TBA)
TA Coordinator: Harjot Deol biol2040@yorku.ca

TAs (contact only your own Tutorial Section TAs): Denis Adigamov, Vijay Barathi Elango, Mohammad Imrit, Stephen Anthony Rose.

Dr. Hilliker's Office Hours: TBA; I will have both in-person and online office hours.

Schedule

Lectures: Tuesdays/Thursdays 1:00 – 2:30 pm, ACE 102

Tutorials: Tues. (2:30, 3:30, 4:30 pm) and Wed. (2:30, 3:30, 4:30 pm) – check schedule for room assignments

- **You must attend the tutorial section in which you are registered. If you would like to switch into a different tutorial section, you MUST arrange it through the Undergraduate Biology Office (LSB102). I WILL NOT answer individual requests for tutorial section changes.**

Evaluation

Midterm 1*	20%	**Thurs, February 8** (during class time, ACE 102)
Midterm 2	20%	**Thurs, March 15** (during class time, ACE 102)
Final Exam	30%	**Cumulative.** April exam period, scheduled by Registrar's Office
Tutorials**	20%	10 weekly tutorials, 2% each (will include group work and iClicker); **mandatory even if repeating the course**
Activity points***	5%	In-class (using iClicker)
MasteringGenetics Homework****	5%	Due dates throughout the term will be announced on Moodle

* Please see IMPORTANT information on missed midterm and final exam policy under "Course Policies". You do not need to provide medical documentation to support your missing a midterm. Midterm tests and final exam will be composed of both multiple-choice and short-answer questions. Both midterms and the final will be processed using Crowdmark, and marked midterms will be available to you for viewing online. Please see instructions on how to submit re-marking requests under "Course Policies". Final exams will be available for viewing in the Biology office, but will not be sent to your directly via Crowdmark.

** **Tutorials** are mandatory and you must attend the tutorial in which you are registered. Makeup tutorials may be available for students with valid reasons. You must e-mail Harjot Deol as soon as you know you will not be able to attend a tutorial, and ask for a makeup opportunity. Because tutorials are held within a very short time frame, makeup tutorials may not be possible. In this case, the weight of the missed tutorial may be added to the final exam. This policy applies only to tutorials missed for legitimate reasons.

***** Activity points:** In order to earn full activity points (5% of course total), you must participate in at least 70% of in-class activities. These activities will include iClicker questions and problems given during lectures. Midterms and tutorial work do not count toward in-class activities. If you participate in fewer than 70% of activities, your activity points will be proportionately reduced. Your in-class participation will not be graded – you earn points simply for attending and being engaged during classes. You can opt out of participating in in-class activities (**this MUST be done before January 14th by e-mailing Harjot Deol**), and then the weight of your activity points will be moved to the final exam, making it worth 35% of the final grade. No requests to opt out of activity points will be granted after January 14th.

The iClicker software is free, and requires that you have a (charged) web-enabled device such as a smartphone, tablet, or laptop. If you do not have such a device, the library loans out tablets and laptops. **Having an iClicker-enabled device is the only way to participate in in-class activities.** No activity points can be earned by submitting your answers on paper! If you decide not to use an iClicker-enabled device, then please do not forget to opt out as described above. Since you only need to participate in 70% of activities to earn full credit, I will not offer any accommodations to students who happen to forget their device at home, or run out of charge, etc, on a random occasion.

****** MasteringGenetics homework:** Several online homework assignments will be provided throughout the term. To access the homework you will need to set up an account and register using the MasteringGenetics code that you purchased with the custom textbook. **You may opt out of this online homework by e-mailing Harjot Deol by January 14th.** If you opt out of the homework, the weight of the homework will be moved to the final exam, making it worth 35% of the final grade. No requests to opt out of the homework will be granted after January 14th.

Important Dates

Start of classes:	January 4
Last day to switch tutorials:	Mon. January 8th
Tutorials start:	The week of January 8; tutorials run weekly; no tutorials the week of February 19, and April 2
Drop Deadline:	March 9 (Last day to drop the course without course on transcript)
Course withdrawal:	April 6 (Course still appears on transcript, but no grade is shown)
End of classes:	April 6
Final Exam:	TBA, during April exam period (cumulative)

For additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website.

Resources

1. Textbook (REQUIRED):

- **Klug et al. 2nd Custom Edition for York University. Concepts of Genetics.** Available new at the York university bookstore (~$130).
  - Available as softcover (can be re-sold) OR e-book (essentially 12-month rental code; can't be transferred between individuals – i.e., can't sell it/give it away).
  - Students are expected to read relevant sections of the text, watch videos, read other assigned materials prior to class.

2. Moodle Site:

Announcements, grades, and other course information are communicated through the course Moodle site. All lecture slides and other relevant material will be posted on Moodle as course proceeds. You will have access to online office hours with Dr. Hilliker using Adobe Connect through Moodle.

Learning Goals & Outcomes

Upon successful completion of BIOL2040, you will be able to:

1. Relate concepts from BIOL 1000 and 1001 to those in BIOL 2040.
2. Communicate information, arguments, and analyses accurately and reliably in verbal and written form during class/tutorial activities, and on assignments, quizzes, and exams.
3. Work effectively with others in a tutorial, class, and exam setting.
4. Use genetic terminology in its correct scientific context.
5. Describe the molecular anatomy of genes and genomes.

6. Compare different types of mutations and describe how each can affect genes and the corresponding mRNAs and proteins.
7. Explain the molecular basis, at the protein level, for alleles with different genetic outcomes.
8. Describe the mechanisms by which an organism's genome is passed on to the next generation.
9. Describe the phenomenon of linkage and how it affects assortment of alleles during meiosis.
10. Describe the approaches and methods used to conduct genetic studies in model organisms.
11. Justify the value of studying genetics in organisms other than humans.
12. Analyse phenotypic data and deduce possible modes of expression/inheritance (e.g., incomplete dominance, autosomal, X-linked) from family histories (pedigrees).
13. Extract information about genes, alleles, and gene functions from genetic crosses and pedigree analysis.
14. Interpret results from molecular analyses to determine the inheritance patterns and identities of human genes that can mutate to cause diseases.
15. Apply the results of molecular genetic studies in model organisms to understand aspects of human genetics and genetic diseases.
16. Describe the processes that can affect the frequency of phenotypes (and genotypes) in a population over time.

Additional learning objectives may be provided for individual topics throughout the course.

Course Content

BIOL 2040 (Genetics) is a course designed to help you explore, understand, and apply the foundations of genetics. In this course, we'll be looking at genetics as a method of scientific discovery to solve problems in terms of health and disease, as well as modelling evolutionary processes. Some of the concepts we discuss will seem quite familiar, but if you don't really get them, you won't really understand any of the higher-level concepts. So, that being said, approach this course with an open mind. If we review something, and spend time on it, try to consider why it might be important to review the concept. In this course we'll be moving beyond the basic terminology, but having a firm grasp of that terminology is absolutely essential for success in building a conceptual understanding of genetics. Conceptual understanding of the foundation of genetics is necessary to understand genetic diseases (including non-hereditary ones), breakthroughs in modern medicine, and risks to species on Earth.

Experiential Education and E-Learning

E-Learning components:

- Moodle Website
- iClicker
- MasteringGenetics homework

Other Information

N/A

Course Policies

1. E-MAIL ETIQUETTE:

- Use your Yorku email address as other email addresses (e.g., Hotmail) are filtered out by the university's email system and don't reach their intended recipient. **Please do not use the Moodle email function or respond to course announcement emails.**
- I'll try to respond within 2 business days, but this is not always possible. I typically do not check email between 7 pm & 7 am, nor on the weekends.
- **Subject line:** your name, student number and a brief indication of topic (*e.g.,* 'Question regarding gene regulation). I receive a lot of email and this practice helps me sort emails efficiently. **Emails without the required information will not receive a response.**
- **Please include your NAME at the end of each email.**
- Tutorial-related queries should be directed to Harjot Deol, not to me. Don't be surprised if you don't receive a response to a question that could be easily answered by looking at the Course Outline or the Moodle site. Also, don't write to me asking what you missed in class—ask classmates instead.
- Due to the size of the class, I will not be able to offer individual tutoring by e-mail. If you need help, please consider attending my in-person and online office hours.

2. **MISSED MIDTERMS/FINAL:**
   - No makeup tests will be offered. Those students who missed a test with a legitimate reason will need to e-mail me within 5 business days of the missed test. You DO NOT need to provide any documentation for your absence. Upon the approval of your request, the weight of the missed test will be added to your final exam. Please be advised that you should carefully think about using this option and how this may affect your final grade. Making the final exam very heavily weighted will put a lot of pressure on you during the finals session.
   - **ALL students** who miss the **FINAL EXAM** MUST submit a deferred standing agreement (DSA), to the Biology Undergraduate office (LSB102) within 5 business days of the missed exam. The DSA must be accompanied by the documentation supporting the absence. If your DSA is approved, you will be given an opportunity to write the deferred final exam. If your DSA is denied, you will need to petition to your home faculty.

3. **REGRADING/MARK CALCULATION ERRORS:**
   - If you believe a written answer on a test was marked incorrectly you must submit a written rationale to 102 LSB (Undergraduate Biology Office) within 1 week of the test being made available to you. **NOTE: re-marking can result in the mark being raised, confirmed, or lowered.**
   - To be fair and consistent with regards to the entire class, **individual grades are NOT negotiable**. We cannot provide 'extra credit' assignments. **Marks for assignments and tests are not 'rounded' or 'bell-curved'.** Contact me (biol2040@yorku.ca) about marks **ONLY if there is a clear error in your mark (calculation, clerical, etc.) within ONE (1) week of the test score being made available to you.** It is highly unlikely that you will receive a response regarding any other mark-related queries.

4. **ACCOMMODATIONS:**
   - **Submit a scan or photo of CDS Accommodation letters via the Biology Department's Online Document Submission System 102 LSB as soon as possible.**
   - Please make the instructors (and TA Coordinator if labs are affected) aware of any religious observance conflicts occurring at any point during the term, for which accommodations will be required (no accommodations will be made for clicker questions; please see above) as soon as possible.
   - **Please note:** "Senate policy states that students are expected to monitor their progress in courses, taking into account their personal and academic circumstances, and to make the necessary adjustments to their workload to meet the requirements and deadlines." (from Senate Policy of Students' Responsibilities in the Petition/Appeal Processes).
   - Students with physical, learning, or psychiatric disabilities who require reasonable accommodations in resources or evaluation methods are encouraged to consult with the Office for Persons with Disabilities (OPD) and ensure that requests for appropriate accommodations are arranged with the Section Instructor early in the term.

5. **ACADEMIC INTEGRITY:**
   - Students should be familiar with, and follow York University's policies regarding academic integrity. See: https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/

6. **RECORDING LECTURES:**
   - **Permitted**

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. 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.

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 at Keele
Counselling (Glendon)
York Accessibility Hub

Ethics Review Process
York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants.* In particular, students proposing to undertake research involving human participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

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 an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre.

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. Click here for the policy and procedures governing disruptive and/or harassing behaviour by students in academic situations.