

## Department of Biology Course Outline

### SC/BIOL 2040 3.00 Genetics Winter 2019

#### 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 Director:** Dr. Arthur Hilliker [genes@yorku.ca](mailto:genes@yorku.ca)

**(ALL EMAIL MUST BE SENT TO THIS COURSE ADDRESS!  
MESSAGES SENT TO ANY OTHER EMAIL ADDRESSES WILL  
NOT BE REPLIED TO.)**

Dr. Hilliker's Office Hours: Tue and Thurs 3:00 – 4:00 pm at LSB104

**Tutorial Coordinator:** Mojtaba Ahmadi [genes@yorku.ca](mailto:genes@yorku.ca)

**Tutorial Teaching Assistants (TAs):** Gursimran Bahia  
Bandelee Morrison  
Marlee Ng  
Tanushree Tiwari  
Mahtab Zonouzi-Marand.

**(contact only the TAs for your own tutorial section)**

#### Schedule

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

**Tutorials:** Tues. and Wed. – check schedule for room assignments

**TUTORIALS BEGIN DURING THE WEEK OF JANUARY 14.**

- **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		
<b>Midterm 1*</b>	20%	<b>Thurs, February 7</b> (during lecture period, ACE 102)
<b>Midterm 2*</b>	20%	<b>Thurs, March 14</b> (during lecture period, ACE 102)
<b>Tutorials**</b>	20%	10 weekly tutorials, 2% each. Tutorial questions will be provided as worksheets to be completed either individually or with a group during the tutorial period. Tutorial worksheets will be processed using Crowdmark and returned to you online. <b>Tutorials are mandatory for all enrolled students, even if repeating the course.</b>
<b>Online Homework</b>	5%	There will be 10 homework assignments available on Moodle throughout the semester, starting during the week of January 14th. Each assignment will open on a Wednesday and will be due at 11:59 pm on a Sunday of the same week. Each assignment will consist of 5 questions. <b>There will be no opportunity to make up for an unfinished assignment (no exception!).</b>
<b>Final Exam*</b>	35%	<b>Cumulative.</b> A date during the April exam period will be scheduled by the Registrar's Office and published sometime in March.

\* Please see IMPORTANT information on missed midterm and final exam policy under "Course Policies". You do not need to provide any documentation to support your missing a midterm. Midterms 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 made available to you for viewing online. Please see instructions on how to submit re-marking requests under "Course Policies". Final exam will be available for viewing in the Biology office, but will not be sent to you directly via Crowdmark.

\*\* Tutorial attendance is mandatory, and you must attend the tutorial in which you are registered. No makeup tutorials will be offered. If you miss a tutorial, its weight will be moved automatically to the final exam. You do not need to provide any documentation to explain your absence, or email the tutorial coordinator informing him of your absence. A student may miss a maximum of 4 tutorials during the semester to allow for possible unexpected circumstances. If a student misses more than 4 tutorials during the semester, they will be given a zero mark for the 5<sup>th</sup> and all subsequent missed tutorials.

Important Dates	
<b>Classes start:</b>	January 3
<b>Tutorials start:</b>	The week of January 14 (no tutorials the week of January 7, February 18, and April 1)
<b>Online homework begins:</b>	The week of January 14
<b>Drop Deadline:</b>	March 8 (Last day to drop the course without receiving a grade)
<b>Course withdrawal:</b>	April 3 (Course still appears on transcript, but no grade is shown)
<b>End of classes:</b>	April 3
<b>Final Exam:</b>	TBA, during the April exam period
<i>For additional important dates such as holidays, refer to the <a href="#">"Important Dates"</a> section of the Registrar's Website.</i>	

## Resources

### 1. Textbook (REQUIRED):

#### • Klug et al. 2<sup>nd</sup> Custom Edition for York University. Concepts of Genetics.

Available new at the York university bookstore.

- 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 advised to read relevant sections of the text 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 the course proceeds.

## 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
- Crowdmark
- Group work during tutorials

## 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 do not always reach their intended recipient. **Please do not use the Moodle email function or respond to course announcement emails.**
- I will try to respond within 2 business days, but this is not always possible. I typically do not check email between 5 pm and 9 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 Mojtaba Ahmadi (at genes@yorku.ca), not to me.
- 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 office hours.

### 2. MISSED MIDTERMS/FINAL:

- No makeup midterms will be offered. If you cannot make it to a midterm, you DO NOT need to provide any documentation for your absence. The weight of the missed midterm will be automatically transferred 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 the course to your home faculty.

### 3. RE-MARKING REQUESTS:

- If you believe a written answer on a test was marked incorrectly you must submit a written rationale detailing the suspected error through Moodle (instructions to be given at a later date) within 1 week of receiving a Crowdmark link to your marked paper. I will aim to address all re-marking requests within 1-2 weeks of receiving them.
- **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 ([genes@yorku.ca](mailto:genes@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 tutorials are affected) aware of any religious observance conflicts occurring at any point during the term, for which accommodations will be required 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: All lectures will be recorded and posted on Moodle.

## 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](#).