

## Department of Biology Course Outline

### Biol 3110, Molecular Biology I: Nucleic Acid Metabolism Section B, Fall, 2022

#### Course Description

Discussion of the metabolism of DNA and RNA, including the physical-chemical properties of nucleic acids; DNA-protein interactions; chromosome structure; nucleic acid replication, repair and recombination; recombinant DNA technology. Three lecture hours. One term. Three credits.

#### Prerequisites (strictly enforced)

SC/BIOL 2020 3.00, SC/BIOL 2021 3.00, SC/BIOL 2040 3.00, and SC/BIOL 2070/2071 3.00.

#### Course Instructor(s) and Contact Information

Dr. Yi Sheng  
Life Sciences Building, Rm 327B  
[biol3110.yorku@gmail.com](mailto:biol3110.yorku@gmail.com)  
416-736-2100 x 33521

#### Schedule

**Lectures:** Tues and Thurs, 10:00 – 11:30 AM, CLH L

**Office Hrs:** Thurs, 12:00 PM – 1:00 PM, by appointment via Zoom (see course eClass page for links).

#### Evaluation

Two midterm tests, each worth 25% of the overall mark

Five random in-class iClicker quizzes, worth a total of 5% of the overall mark

Final exam, worth 45% of the overall mark

Note: Final exam is cumulative but weighted (usually > 65% of questions is on material post midterm 2)

#### Important Dates

**Midterm 1:** Thurs, Oct 6<sup>th</sup>, 2022

**Midterm 2:** Thurs, Nov 10<sup>th</sup>, 2022

**Final exam:** To be scheduled within the official exam period (Dec 8<sup>th</sup> to 23rd, 2022)

**Drop Deadline:** Nov 11<sup>th</sup>, 2022 (last day to drop without course on transcript)

**Course Withdrawal:** Nov 12<sup>th</sup> to Dec 7<sup>th</sup>, 2022 (course still appears on transcript with 'W')

## Resources

No specific text required

Optional: Molecular Biology of the Gene, 7<sup>th</sup> Ed, Watson et al

Lectures slides will be posted on eClass the night before each lecture, but the FINAL version of the slides will be posted AFTER the lecture has been given.

Lectures will be recorded by Panopto, but **note that material presented on the blackboard or by physical demonstration (often important and may be on exams) will not be captured** by Panopto

A discussion forum will be set up on eClass for students to communicate with one another and to discuss course material. The course director will NOT participate in the forum discussions. Any specific questions for the course director should be directly emailed to [biol3110.yorku@gmail.com](mailto:biol3110.yorku@gmail.com).

## Learning Outcomes

Upon successful completion of this course, students should be:

Knowledgeable in nucleic acids-related properties and concepts

Knowledgeable in the molecular details of DNA structure, topology, and their impact on biological processes such as DNA replication

Knowledgeable in DNA-based genomes and how genomes are organized

Knowledgeable in how genome organization and chromatin structure impact on various biological processes and functions

Knowledgeable in experimental techniques, and interpretation of results

Appreciative of the experimental nature of scientific discoveries

Able to apply knowledge and critical thinking in exams

## Course Content

TOPICS COVERED INCLUDES:

1. DNA basics: history, chemical composition and physical properties of nucleic acids
2. RNA structures and functional RNAs
3. DNA topology and topoisomerases
4. DNA synthesis and replication
5. Telomeres and telomerase
6. Methods for studying DNA and molecular biology techniques
7. Genome organization/packaging of prokaryotes and eukaryotes
8. Chromatin/chromosome states and long-range chromosome interactions in interphase genomes
9. Regulation of genome replication
10. Epigenetics and chromatin regulation

## Communication with your Course Director

**Office Hours:** Office hours are between 12 – 1 PM on Thursdays via Zoom. Students should use the Scheduler link on eClass to check and book appointments for one-on-one meetings.

**Email contact:** All course-related communication, including questions related to course material, or communications regarding accommodations or missed exams etc., should go through the course-specific email account ([biol3110.yorku@gmail.com](mailto:biol3110.yorku@gmail.com)). Questions on course material requiring short answers can be asked via email up to **24 hours before a midterm or final**.

**Email etiquette:** Your emails must include your name and student number

**Expectations:** Students are **expected to attend lectures in-person** or, at minimum, access the Lecture Capture recordings posted on eClass. ALL lecture material (including verbal and extra information written on the blackboard etc) are considered testable material on midterms and final exams.

## Course Policies and other information

1. All students must strictly abide by York's Academic Honesty and Integrity policies (see University Policies section in this course outline).
2. Students, TAs and the Course Director are all expected to communicate or interact with one another in a respectful and cordial manner. Any form of verbal or cyber bullying will **NOT** be tolerated and can result in expulsion from class and/or course.
3. In the event of one missed midterm with a valid documented reason, the weight of this midterm will be distributed evenly between the other midterm and the final exam. **No makeup exam will be available for midterms.** In the event that a student missing more than one exam with valid documented reasons (two midterms, a midterm and a final, or all three exams), the student will be **required to petition** in order to take a deferred final exam.
4. Students who do not write the final exam but have completed both midterms must submit a Deferred Standing Agreement form to the **Biology Undergraduate office (LSB 102)** 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 at some point during the S2 term. If your DSA is denied, you will need to petition the course to your home faculty. If you miss the deferred final exam (for any reason), you will be required to file an academic petition to your home faculty. Please check out the Registrar's Office Deferred Standing FAQs ([http://www.registrar.yorku.ca/services/ds\\_faq.htm](http://www.registrar.yorku.ca/services/ds_faq.htm)) for more details.
5. In order to be fair and consistent to the entire class, individual grades are non-negotiable. Contact the Course Director about marks **ONLY** if there is a clear error in your mark (calculation, clerical, etc.), and as soon as possible at [biol3110.yorku@gmail.com](mailto:biol3110.yorku@gmail.com).
6. All lecture material (posted lecture slides and recordings) are copyrighted and **NOT** to be distributed without permission. Students are also **NOT** allowed to copy, record, share or distribute any midterm or final exam contents.

## 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.

Accordingly, to avoid this risk, students are urged **NOT** to upload their work to these sites. Whenever a student submits work obtained through a third-party site (e.g. Course Hero, One Class etc.), 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.

***Penalties associated with charges of Academic Misconduct can include zero on the assignment, letter grade reduction, failure in the course, notation on the transcript, suspension.***

***Please Do Not Cheat, it is not worth it, and ultimately hurts your learning.***

**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.

Student's 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/>

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](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/>