

Department of Biology Course Outline

Biol 3110, Molecular Biology I: Nucleic Acid Metabolism Section A, 2021 Fall

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. 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. Peter Cheung
Life Sciences Building, Rm 331A
yorkubiol3110@gmail.com
416-736-2100 x 31322

Schedule

Lectures: Tues and Thurs, 10:00 AM, online via Zoom (for recap and Q & A). In addition, there are pre-recorded lectures each week that cover the bulk of the lecture material.

Office Hrs: Thurs, 2 PM – 4 PM, by appointment through eClass Scheduler and via Zoom

Evaluation

1. Two midterm tests, each worth 25% of the overall mark
2. Final exam, worth 40% of the overall mark (final exam is cumulative but weighted more heavily on last part)
3. Activity component, worth 10% of the overall mark (to be finalized and will be posted on eClass the week of Sept 13)

Important Dates

Midterm 1:	Tues, Oct 5 th , 2021, 10 – 11:30 AM
Midterm 2:	Tues, Nov 9 th , 2021, 10 – 11:30 AM
Final exam:	TBD (Between Dec 9 – 23, 2021)
Drop Deadline:	Nov 12 th , 2021 (last day to drop without course on transcript)
Course Withdrawal:	Nov 13 th to Dec 7 th , 2021 (course still appears on transcript with 'W')

Resources

No specific text required

Optional: Molecular Biology of the Gene, 7th Ed, Watson et al

Genomes, 2nd Ed (2002), T.A. Brown
<http://www.ncbi.nlm.nih.gov/books/NBK21128/>

Relevant lectures notes and links to pre-recorded lectures will be posted on eClass Mondays of each week. Live recap lectures and Q&A sessions conducted by Zoom on Tues and Thurs will be recorded and links to those will be posted on Moodle after the lectures.

A discussion forum will also 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 yorkubiol3110@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 science as a process and the experimental nature of scientific discoveries

Able to apply knowledge and critical thinking in exams

Course Content

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 DNA replication
10. Epigenetics and chromatin regulation

Course and Other Information

Lecture format: Lectures will start at 10 AM on the scheduled class dates and the live sessions are delivered via Zoom (link is posted on eClass page). On Tuesdays, the instructor will do a recap of the previous week's pre-recorded lectures, explain concepts in more details, and answer questions from students. On Thursdays, the live sessions will just be Q & A to answer student questions. The live sessions are intended to last about 1 hr for each class; however, this will vary depending on the lecture material and class participation. Students should use the remaining scheduled class time (plus additional time if needed) to view the pre-recorded lectures for the week.

Equipment needed for online learning: As the course is delivered online, each student will need **i)** a computer or equivalent for accessing online material; **ii)** software such as Zoom to participate in the live Zoom sessions, **iii)** access to internet for the streamed and recorded lectures, **iv)** a webcam for online interaction; and **v)** a suitable learning environment for listening to pre-recorded lectures and for participating in the live lectures.

Joining Zoom meetings: Students must join Zoom meetings through the links posted on eClass and **must sign in to Zoom using the SSO sign in.**

Zoom and privacy: Part of the course is conducted live via Zoom and will be recorded for broader student access. Note that Zoom is hosted on servers in the US. If students have privacy concerns about their data, they should only provide their first name when joining a session. Note also that the system is configured such that all participants are automatically notified when a session is being recorded.

Students are reminded here that all lecture material posted online (via eClass and Zoom) are **copyrighted** and they are **NOT allowed to download, copy, or keep the recorded material.** Students are also **NOT allowed to distribute or share the online course material.**

Midterm and final exam format: All midterms and exams will be conducted through quizzes on eClass. All exams are **closed-book** exams and will consist of **both** multiple-choice and written answer questions. Students are required to have access to the minimum technology requirements to complete exams. Technology requirements and FAQs for eClass can be found here: <https://lthelp.yorku.ca/student-guide-to-moodle>

Course activity: A Biosketch activity designed to increase student engagement and learning will be implemented this year. Details of the activity will be posted on the course eClass site and this assignment will be worth 10% of the total grade.

Office Hours: Office hours are scheduled between 2 – 4 PM on Thursdays and will be conducted via Zoom and students are expected to turn on their videos to facilitate face-to-face interactions. A link for the scheduled weekly office hour meetings is posted on eClass. Students should book appointments using the Scheduler link posted on eClass.

Email contact: All other 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 (yorkubiol3110@gmail.com)**. Questions on course material requiring short answers can be asked via email up to 24 hours before a midterm or final.

Expectations: Students are EXPECTED to access and study ALL online class material (including posted lecture slides, pre-recorded lectures, and recordings of live lectures) for exam preparation. All lecture material in the pre-recorded lectures as well as those presented at the live Zoom lectures are considered testable material in midterm and final exams.

Important Course Policies

1. As part the course is conducted live online, students must conduct themselves in appropriate and proper etiquette. Students who show disruptive behaviour **will be removed** and may be locked out of the class meeting.
2. As the midterms and final exam are conducted online, students must strictly abide by York's Academic Honesty and Integrity policies (see University Policies section of this course outline).
3. Students are **required** to complete a Course Policy and Academic Honesty Agreement on eClass **by Sept 23, 2021**. Completion of this assignment acknowledges that the student has read and understood the course and academic honesty policies and agree to abide by the stated rules and policies. Students who fail to complete this assignment **WILL NOT** be given access to midterm and final exams.
4. **All exams are closed-book exams** and students are **NOT allowed to use or access study aides, nor communicate with others via any communication methods during exams**. Students should familiarize themselves with the use of eClass and how to access online exams/quizzes ahead of the actual exams.
5. During the midterms and final exams, **students are NOT allowed to communicate with anyone else via ANY means of communication**. Doing so is a breach of academic honesty rules and are grounds for automatic failure of the course and possible expulsion from the University.
6. If you miss a midterm exam with a legitimate documented reason, documentation must be submitted to the course director in order to avoid receiving a grade of zero on the exam. Please fill out the absence form and append a detailed and official doctor's note (i.e. not simply a form stating the student visited a clinic) using the online submission system:
<http://science.apps01.yorku.ca/machform/view.php?id=84113>
7. 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 misses 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 the deferred final exam.
8. Students who do not write the final exam, but have completed both midterms, must submit a Deferred Standing Agreement form to the **Course Director (by email)** 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. If you miss the deferred final (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) for more details.
9. In order to be fair and consistent to the entire class, individual grades are not negotiable.
10. Students are **NOT** allowed to record or make copies of the pre-recorded lectures, nor the live lectures on Zoom, using their own recording devices. Students are also **NOT** allowed to copy, record, share or distribute any midterm or exam contents.
11. Students should communicate with and treat other students, TAs and Course Director with respect and courtesy. Cyber bullying or harassment will **NOT** be tolerated and can result in expulsion from class and/or course.

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

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-andor-harassing-behaviour-in-academic-situations-senate-policy/>