

## Department of Biology Course Outline

### SC/BIOL 2020 Section M Biochemistry 3.0 Winter 2022 Remote/In-Person

#### Course Description

A study of the cell biology and biochemistry of biomolecules. Topics include intermediary metabolism related to bioenergetics, including the biology of mitochondria and chloroplasts, protein structure and function, nucleic acid replication, gene expression, chromosome organization and recombinant DNA technology.

Not open to Chemistry majors. Three lecture hours. One term. Three credits.

\*Please note that lectures will be delivered remotely as per York University Guidelines from January 10, 2022, to January 31, 2022.

\*\*Please continue to check for updates on [Better Together \(yorku.ca\)](https://www.yorku.ca/better-together)

#### Prerequisites

1. Both SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00, or SC/ISCI 1110 6.00, or both SC/ISCI 1101 3.00 and SC/ISCI 1102 3.00.

**and**

2. Both SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00, or SC/CHEM 1000 6.00, or both SC/ISCI 1201 3.00 and SC/ISCI 1202 3.00, or SC/ISCI 1210 6.00.

Course credit exclusion: SC/CHEM 2050 4.00.

#### Course Instructor and Contact Information

Dr. Nezeka Alli

Email: [nezeka3@yorku.ca](mailto:nezeka3@yorku.ca)

Please write 'BIOL 2020' in subject line for all emails

Virtual Office Hours: Fridays 1:00 PM – 2:00 PM – Zoom (registration required).

See eClass page for registration link for office hours.

## Schedule

### Lectures:

Tuesday and Thursday 11:30 AM – 1:00 PM

### Location:

Remote delivery via Zoom (please use Zoom link found on eClass page)  
In Person in LAS C

## Technical Requirements for Taking this course

In addition to stable, higher-speed Internet connection, students will need a computer with webcam and microphone, and/or a smart device with these features. Quizzes and submission of assignments must be done via desktop or laptop computer.

To determine Internet connection and speed, there are online tests, such as [Speedtest](#),

Useful links for computing information, resources, and help:

[Student Guide to Moodle](#)

[Zoom@YorkU Best Practices](#)

[Zoom@YorkU User Reference Guide](#)

[Computing for Students Website](#)

[Student Guide to eLearning at York University](#)

## Organization of the Course

The lectures will be delivered remotely and in person. Submission of assignments, participation/discussion, and test-taking (quizzes and midterms) will take place on the course eClass, unless otherwise indicated by course instructor. The final exam will be in person and the date and time will be determined by the Registrar's Office.

### Synchronous Mode of Delivery

-Tuesday and Thursday - Zoom meeting/in-person during scheduled times determined by the Registrar's Office. Expected to meet at scheduled time however, all live sessions will be posted on eClass (study aid).

-lectures are broken into three-20 min segments each followed by Q and A period (please allow flexibility with these times)

-PPT slides will be posted prior to class

-Quizzes – on eClass (see course Calendar)

-Submission of assignments – on eClass (See course Calendar for due dates)

-Midterms – on eClass

-Final exam – in person

## Evaluation

### Midterm 1 (20%)

- Multiple choice, short answer, calculations, non-sequential
- To begin at 11:30 AM sharp, 25-30 Questions, 90 min total allowed time

### Midterm 2 (20%)

- Multiple choice, short answer, calculations, non-sequential
- To begin at 11:30 AM sharp, 25-30 Questions, 90 min total allowed time

### Quizzes (10%)

- Weekly Quizzes (10 total), online on eClass
- Best 8 of 10 counted
- Multiple choice
- Opens Friday at 12:01 AM and closes Tuesday at 11:59 PM, 2 attempts, highest of 2 attempts counted

### Peer-assessed writing project (10%)

- Write a short summary, submit on eClass
- Review 3 of your peer's assignments, submit on eClass

### Compose Multiple Choice Question assignment (5%)

- Compose 10 multiple choice questions (1 per week), submit on eClass
- Submit between Friday at 12:01 AM and Tuesday at 11:59 PM

### Final exam (35%)

- Multiple Choice, short answer, calculations, non-sequential
- Date/Time TBD by Registrar's Office
- Question breakdown will be provided at the end of the term

**Midterm information:** Midterms will be conducted during lectures (11:30 AM – 1:00 PM) through eClass. Midterms may consist of multiple-choice, short-answer, and calculation questions. If you miss the midterm (for any reason, including Internet connectivity problems), its weight will be automatically moved to the final exam. No need to submit any documentation. There will be no make-up midterms.

**Weekly online Quizzes:** The quizzes will be offered through eClass. You will be given two attempts for each quiz, with the highest score of the two counting as the quiz mark. Only best eight completed quizzes will count towards your grade. You can miss any two quizzes for any reason, including illness. You will earn a zero for every missed quiz beyond the allowed two, no exceptions.

**Peer-assessed writing project:**

- Choose any topic that we have covered in the course (or will cover in the coming lectures) and prepare a 1-page written summary of it following the specific instructions that will be posted on eClass.
- Your submission will be reviewed by 3 anonymous peers from the class, and you will review 3 submissions by other students.
- The grade for the project will be determined by the reviews you receive and by the completion of your own reviews.
- Submissions will be due on March 30, and the reviews will be due on April 6. The project will be administered using eClass.

**“Compose a multiple-choice question” assignment:**

- As you study for the quizzes and midterms, you will compose your own multiple-choice (MC) questions that you believe could be used on these evaluations.
- Each week you will compose 1 multiple choice question (with 5 answer options) and submit it to eClass. See course calendar for the submission due dates.
- No deadline extensions will be provided, regardless of the circumstances. By the end of the semester, you will have submitted a total of 10 multiple choice questions. They will be reviewed by the TA. Only valid multiple-choice questions will be accepted (please do not submit random text).

**Final exam information:**

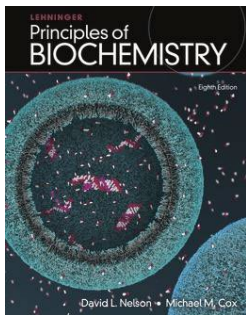
- The exam will be cumulative and will cover all the course evenly
- The date and time of the exam will be determined by the Registrar’s Office.
- It is the student’s responsibility to check the Registrar’s Office website for final exam schedule.
- The format of the exam will be similar to midterms. More information about the exam will be provided towards the end of the semester.

**Important Dates**

<b>Start of Classes:</b>	January 10, 2022
<b>Winter Reading Week:</b>	February 19 – 25, 2022
<b>Drop Deadline:</b>	March 18, 2022 (Last day to drop the course without receiving a grade)
<b>Course Withdrawal:</b>	March 19, 2022 – April 10, 2022 (Course still appears on transcript, but no grade will be shown; W notation)
<b>End of Classes:</b>	April 10, 2022
<b>Final Exam:</b>	TBA, during the April exam period (April 12 – 29, 2022)

For additional important dates such as holidays, refer to the [“Important Dates”](#) section of the Registrar’s website.

## Resources



**Textbook:** Lehninger Principles of Biochemistry, 8<sup>th</sup> edition (ISBN-13: 978-1-319-22800-2). The textbook is available from the York University Bookstore as soft-cover, loose-leaf and e-text versions. Reserve copies will be available at the Steacie Science library. Earlier editions of the text could be used for readings, but page numbers and problem numbers will correspond to the 8<sup>th</sup> edition. There will be weekly suggested readings and assigned end-of-chapter problems from the textbook.

## Learning Outcomes

### By the end of the course, you should be able to:

- Identify major classes of biological molecules and their polymers by their chemical structure
- Describe the chemical properties of proteins, nucleic acids, carbohydrates, and fatty acids, and the details of their metabolism
- Describe the mechanisms by which biological molecules and systems are regulated and coordinated in normal and diseased states
- Describe the relationship between energy and biological processes, and know how organisms utilize and store energy
- Describe the mechanisms by which cells store and express genetic information
- Explain and interpret data from the various biochemical contexts taught in class
- Apply the acquired knowledge and understanding to synthesize logical conclusions from experiments and experimental results.

## Course Content

This second-year course will focus on a wide range of topics within Biochemistry. In order to fully understand the material presented during lecture, a basic understanding of chemical principles and cellular molecular biology (i.e., BIOL 1000 and CHEM 1000 & 1001) will be expected of enrolled students. Although most of the curriculum can be found in the course recommended text, certain topics, such as the practical application of several biochemical techniques, will NOT be found in the text. Thus, in order to be as successful as possible, each student should study both the material presented in lectures and in the assigned textbook readings.

### Unit 1: Buffers, Amino Acids and Protein

- Introduction, chemical bonds
- Water acids and bases, buffers
- Amino acids and protein structure, protein purification
- Protein Function
- Enzyme Kinetics and Inhibition

### Unit 2: DNA and RNA Structure and Techniques

- Carbohydrates
- Nucleotides and nucleic acids
- DNA replication and Repair
- RNA transcription and processing
- Translation and protein targeting and degradation
- Regulation of Gene Transcription
- Recombinant DNA technology

### Unit 3: Metabolism

- Metabolism and energy transfer
- Glycolysis and gluconeogenesis
- Oxidation of pyruvate, citric acid cycle
- Oxidative phosphorylation and electron transport
- Metabolism of fatty acids
- Metabolism of amino acids
- Coordination of metabolism

*Please refer to course Calendar on eClass page for details (topics, date and readings)*

## Experiential Education and E-Learning

### E-Learning components:

- eClass Website, synchronous lectures, and office hours via Zoom
- Weekly online homework and Quizzes
- Writing and peer-review activity

## Course Policies

1. Missed evaluation policy: If you miss the midterm (for any reason), its weight will be automatically moved to the final exam. No need to submit any documentation. There will be no make-up midterms.
2. If you request that I re-mark an evaluation, please keep in mind that re-marking can result in your score being raised, confirmed, or lowered. Second round of re-marking will not be offered.
3. Standard accommodation policies as set by the university will be followed in the course.
4. All students in the course must be familiar with York University's policies on academic integrity. Please consult the following website for more detail:  
<http://www.yorku.ca/academicintegrity/students/index.htm>

## 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/>

### **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 -

<http://www.glendon.yorku.ca/counselling/personal.html> York Accessibility Hub -

<http://accessibilityhub.info.yorku.ca/>

### **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 or online at [http://www.registrar.yorku.ca/pdf/exam\\_accommodation.pdf](http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf) (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/>



