

## Department of Biology Course Outline

### SC/BIOL 2020 3.0 - SC/BCHM 2020 3.0 BIOCHEMISTRY WINTER 2020

#### Course Description

The study of the biochemistry of biomolecules. Topics include intermediary metabolism, bioenergetics, including biochemistry of mitochondria and chloroplasts, protein structure and function, nucleic acid replication, gene expression, chromosome organization and recombinant DNA technology. Three lecture hours. One term. Three credits.

#### Prerequisites (strictly enforced)

Both SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00 or SC/BIOL 1010 6.00; both SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00, or SC/CHEM 1000 6.00. Course credit exclusions: SC/BIOL 2020 4.00, SC/BCHM 2020 4.00, SC/CHEM 2050 4.00.

#### Course Instructor and Contact Information

**Course Director:** Dr. Vivian Saridakis  
**Office:** Life Sciences Building (LSB) 327A  
**Course Website:** <https://moodle.yorku.ca>  
**Course Email:** BCHM2020@yorku.ca  
**Office Hours:** Tentatively Thursdays 1:00 – 2:00 PM in Room LSB213

#### Schedule

Three lecture hours per week. Tuesday and Thursday at 10:00 am in SLHD.

#### Evaluation

**Midterm 1:** 25% or 0% (optional)      **February 6<sup>th</sup> 2020** - rooms will be announced in class  
**Midterm 2:** 25% or 0% (optional)      **March 12<sup>th</sup> 2020** - rooms will be announced in class

**Final Exam:** 50%, 75% (if one midterm missed) or 100% (if both midterms missed) – date, time and room will be published by the Registrar’s Office.

Midterms are optional. Missed midterms (for any reason) will have their weight transferred to the final exam, up to a 100% final exam. There are no makeup midterms. See Course Policies for other information. Section 1 (material covered up to January 30<sup>th</sup>) will be tested on Midterm 1 and Section 2 (material covered up to March 5<sup>th</sup>) will be tested on Midterm 2. The final exam is cumulative.

Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

## Important Dates

**Midterm 1: February 6<sup>th</sup> 2020** - rooms will be announced in class

**Midterm 2: March 12<sup>th</sup> 2020** - rooms will be announced in class

**Winter Reading Week:** refer to <https://registrar.yorku.ca/enrol/dates>

**Drop Deadline & Course Withdrawal:** refer to <https://registrar.yorku.ca/enrol/dates>

**Final Exam:** Dates/times/rooms for exams are scheduled and published by the Registrar’s Office

**NOTE:** for additional important dates such as holidays, refer to the “Important Dates” section of the Registrar’s Website at <https://registrar.yorku.ca/enrol/dates>

## Resources

**Textbook:** “Lehninger Principles of Biochemistry” by Nelson and Cox, 7th edition. Available at the bookstore.

**Course website:** <https://moodle.yorku.ca>

The lecture slides may be made available on moodle prior to the lecture but it is the responsibility of the student to attend and obtain all course material in person during lectures.

## Learning Outcomes

Upon successful completion of this course, students should understand the major classes of biomolecules, the mechanisms by which cells express genetic information, how organisms utilize and store energy and pathways involved in the biosynthesis and degradation of selected biomolecules. Students should also apply concepts covered in the course to problem sets related to current biochemical methods and research.

## 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 & 1001, CHEM 1000 & 1001) is expected. Although most of the curriculum can be found in the textbook, certain topics, such as the practical application of several biochemical techniques, may not be found in the text.

Thus, in order to be as successful as possible, each student should attempt to be present for all lectures.

Chapters correspond to Lehninger, 7th edition. Coverage of chapters will not be complete, and where indicated the lectures will cover only selected topics from the chapter. Students are advised to attend all lectures and study those sections of the text relevant to the lecture topics. Exam questions will relate to the lecture topics and any related information presented in the lectures that may not be covered in the textbook. Student attendance in classes is EXPECTED and ALL in-class material (including verbal and extra information written on the blackboard) are considered testable material in midterm tests and the final exam.

### **Tentative Lecture Topics**

- Chemistry, acids and bases (chapters 1,2)
- Amino acids, proteins and enzymes (chapters 3-6)
- Carbohydrates (chapter 7)
- Nucleic acids (chapter 8)
- Lipids (chapter 9)
- Bioenergetics and biochemical reactions (chapter 13)
- Glycolysis and gluconeogenesis (chapter 14)
- Metabolic regulation (chapter 15)
- Pyruvate oxidation and citric acid cycle (chapter 16)
- Fatty acid catabolism (chapter 17)
- Amino acid oxidation (chapter 18)
- Electron transport and oxidative phosphorylation (chapter 19)
- Lipid biosynthesis (chapter 21)
- Biosynthesis of amino acids and nucleotides (chapter 22)
- Genes and chromosomes (chapter 24)
- DNA metabolism (chapter 25)
- RNA metabolism (chapter 26)
- Protein metabolism (chapter 27)
- Regulation of gene expression (chapter 28)

**As in all courses, students are expected to spend time beyond the regular course hours in preparation, review, studying, etc., related to the course.**

### **Other Information**

This course emphasizes the ability to apply knowledge gained in BIOL2020/BCHM2020. As a consequence, testing will focus on situations and the ability of the student to analyze data and anticipate outcomes. Again, the critical thinking required by the student would be strengthened by attending all lectures. In order to EARN an "A" in this course, students must demonstrate the ability to apply their knowledge.

## Course Policies

### Missed Midterm Exams

No documentation, explanation, or notification is required for missed midterm exams due to illness, family emergency, or other reasons. If you miss a midterm exam, your grade will be zero but that midterm will automatically be excluded from your final grade calculation, as described above.

### Missed Final Exam

Students who write both midterm tests but miss the final exam for a valid, documented reason may request to complete a deferred exam, at the discretion of the course director. A Deferred Standing Agreement form and any additional documentation (e.g. Attending Physician's Statement) must be completed and provided to the course director. Student's whose requests are denied may then petition to their home faculty. See "Deferred Standing" at <https://myacademicrecord.students.yorku.ca/deferred-standing> for further details.

Students who missed one or both midterm exams and miss the final exam will automatically be given a grade of zero on the final exam. These students must then submit a petition for deferred standing to their home faculty. The course director will DENY deferred standing. See "Deferred Standing" at <https://myacademicrecord.students.yorku.ca/deferred-standing> for further details. It will be the Petition Committee's decision whether deferred standing is granted; if it is, the Petitions Committee will also set the deadline for completing the deferred exam. The deferred exam will only be scheduled after the petitions committee renders its decision. Denied petitions will result in a zero on the final exam. The format of the deferred exam may be essay, oral, short answer, multiple choice, or a mix of these options.

### Email (BCHM2020@yorku.ca)

Questions regarding the course and course material should primarily be made after class or during office hours. Generally, emails will be answered within two days but this is not always possible so please be patient. However, emails will not be answered for the 24 hours prior to the start of midterm and final exams. Remember, that many of your questions can be answered by reading the course outline or checking Moodle, so before sending an email, consider the nature of your question and first consult the appropriate resources. Your question might also be answered in the next class meeting if appropriate. Alternatively, Questions and answers that are deemed of interest to the entire class will be posted on the appropriate discussion board or sent via course announcements if urgent.

In order to ensure a prompt answer please follow the following guidelines (Email messages not meeting these guidelines may not be answered because of insufficient information): Use your @my.yorku.ca email address - email from other sources may be filtered out and not reach the intended recipient.

**SUBJECT LINE** - Include the course code and brief indication of topic.

Include your name and student number at the end of each email. Its needed to identify you, retrieve the right information and maintain confidentiality. Remember, you are in a professional environment and thus all your written correspondence, including emails, should be professional. This means full sentences, proper grammar, no text message lingo. Please begin your message appropriately: "Dear Professor XXXX"; not "Hey Miss" or "Hey Prof" or "Dude"

### Grading

To be fair and consistent with regard to the entire class, individual grades are NOT negotiable. Extra credit assignments will not be provided. Marks for tests/exams are not "rounded or bell-curved". Contact me about marks ONLY if there is an error (calculation,

clerk, etc.) as soon as possible. Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

### **Copyright**

Photographs or video recordings of any portion of the lectures (including slides), midterm tests or final exams is not permitted. Images and material presented are subject to Canadian copyright law. The lecture material is designed for use as part of BIOL2020: Biochemistry or BCHM2020: Biochemistry at York University and is the property of the instructor/course director unless otherwise stated. Third party copyrighted materials such as book chapters, or lecture slides have been licensed for use in this course only. Copying this material for distribution (e.g. uploading material to a commercial third-party website) can lead to a violation of Canadian copyright law and further prosecution. Students are strongly discouraged from uploading or using material from online resources such as CourseHero.com; OneClass.com etc.

## **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/instructors 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 - 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, since the uploading students had been found in all cases to be willfully blind to the reasonable likelihood of supporting plagiarism in this manner. Accordingly, to avoid this risk, students are urged not to upload their work to these sites. Whenever a student submits work obtained through Course Hero or One Class, 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 or taking pictures of 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.

### **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, April, June or August), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at <https://secure.students.yorku.ca/pdf/religious-accommodation-agreement-final-examinations.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/>