

Department of Biology Course Outline

SC/BIOL 2020 3.00 Biochemistry
Fall 2015

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. Three lecture hours.

Prerequisites

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 Instructors and Contact Information

Course Director: Dr. Terrance Kubiseski

Email: biol2020@yorku.ca

Email policy: Questions requiring short answers can be asked via email up to 24 hours **before** a midterm or final. Please allow for at least 24 hours for a reply. **PLEASE** include a brief and descriptive subject line in your email. If you want a response, all course related questions must be sent to this account. Questions requiring lengthy answers should be asked before or after class, or during office hours.

Second Year Biology Office: Rm 108 Farquharson Building

Second Year Biology Program Assistant: Vanessa Broughton

Schedule

Lectures: Tuesday and Thursday, 8:30 AM - 10:00 AM, LAS A

Office Hours are between 12:30pm - 1:30am Wednesday, Rm 213 LSB.

Evaluation

Evaluation:

Two midterm tests: 20% of overall mark each

Final Exam: 60% of overall mark

The final exam is cumulative but weighted. Each section will end up having equal representation over the 3 exams.

Exam Format: Mostly (or all) multiple choice questions (will be announced in class).

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

Important Dates

Last day to drop course without receiving a grade: November 9, 2015

Midterm I: October 8, 2015

Midterm II: November 10, 2015

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

Fall Reading Days: October 29th to November 1st

Last Class: Dec 3rd

Fall Study Day (no Class): Dec 8th

NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at <http://www.yorku.ca/yorkweb/cs.htm>

Resources

Required text:

McKee and McKee: *Biochemistry: The Molecular Basis of Life*. (2015) 6th ed., Oxford publishing, with study guide.

The 5th edition of McKee and McKee (and study guide) is definitely suitable.

Optional supplementary text:

Tymoczko, Berg and Stryer: *Biochemistry: A Short Course*. (2010) 1st ed., Freeman Publishing.

Alberts *et al.* (2008) *Molecular Biology of the Cell*, 5th ed., Garland Publishing.

Boyer (2006) *Concepts in Biochemistry*, 3rd ed. Wiley Publishing.

Course Website: <https://moodle.yorku.ca>; will include announcements, course materials, PDF files of slides prior to lecture and video capture with audio after lectures.

Please note that access to the slides and audio stream are offered, but **are not guaranteed** to the students of this course. If access is denied or prevented due to a technical issue, it is **NOT** the responsibility of the course director to alter conditions of the course or exam (such as change its date) or provide alternate methods to supply course material to students. 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 be able to:

- Understand in depth the various concepts taught in class.
- Understand various biochemical processes that occur in normal and diseased states.
- Explain and interpret data from the various biochemical situations taught during lectures.
- Apply their 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 1010, CHEM 1000 & 1001) will be expected of candidate 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 attempt to be present for all lectures. Students are also encouraged to consult additional references sources (e.g. biochemistry books on reserve in the library).

Lecture Topics will Include:

- Introduction to chemical bonds
- Water and Buffers
- Amino Acids and Protein Structure
- Enzyme Kinetics and Inhibition
- Carbohydrates
- DNA and RNA structure
- DNA replication and Repair
- Transcription and Translation
- Regulation of Gene Transcription
- Metabolism and Energy Transfer
- Glycolysis and Gluconeogenesis
- NADH production
- Oxidative Phosphorylation
- Coordination of Metabolism

A detailed Lecture Outline is available from the Moodle Course Website.

Experiential Education and E-Learning

This course uses a course website (Moodle) and streaming capture. Some teaching videos/programs related to course topics will be provided.

Other Information

EXPECTATIONS: Attendance is **expected** and all in-class information (even material not written on lecture slides) is testable material in the midterms and final exams.

In order 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 will not be "rounded" or "bell-curved". Contact the Course Director about marks **ONLY** if there is a clear error in your grade (calculation, clerical, etc.) within **ONE** week of the test score being made available to you at biol2020@yorku.ca.

Course Policies

COURSE POLICIES

1. If you miss an exam (midterm or final) with a legitimate documented reason, documentation must be submitted to me (Dr. Kubiseski) in order to avoid receiving a grade of zero on the exam. Only a "York Attending Physician's Statement Form" (can be downloaded as part of the Petitions Package) OR a similarly detailed doctor's note (i.e. not simply a form stating that the student visited a clinic) will be accepted for medical excuses.
2. In the event of one missed midterm with a valid documented reason, the weight of this midterm will be transferred to the final exam. **No makeup exam will be available for midterms.** In the event of a missed final exam with a valid, documented reason (where both midterms have been written), **one** deferred final exam will be offered during the Biology deferred exam period in the winter or spring of 2016. If the deferred exam is missed, the student will be required to petition the course. 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.
3. In order to be fair and consistent to the entire class, individual grades are not negotiable. Contact me about marks **ONLY** if there is a clear error in your mark (calculation, clerical, etc.) as soon as possible at biol2020@yorku.ca.
4. Students are allowed to record lectures using their own recording devices. However, taking pictures of slides and exam questions will **NOT** be allowed. **Absolutely** no cell phones are allowed in the exam hall during midterms or the final exam.

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.

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/>