

Department of Biology Course Outline

Fall, 2022, SC/BIOL2020 B, Biochemistry, Three Credits

Course Instructor: Charlotte de Araujo

How to address me: Prof. Charlotte

Personal Pronouns: (she/her/hers)

Email: cdearauj@yorku.ca

Note: If you have a question or would like to talk with me, you can send an email, visit me during student hours, or approach me before/after class. We will try to respond to email within two working days (not including holidays/weekends), however this is not always possible, so please be patient.

Please remember to exercise proper etiquette in any correspondence:

- Always use your yorku.ca email address - email from other sources may be filtered out.
- Include course code, and a brief indication of topic in the subject line.
- Include your full name and student number at the end of each email so that we can identify you.
- Please use full sentences and proper grammar for readability.
- Please do not use the eClass Messenger for contact. This system is not used for this course.

What are 'Student Hours'?

Student hours are dedicated times through the week for the course instructor and possibly TAs to meet with YOU. Pop in to introduce yourself, ask questions about the course, or discuss content from the course.

Note: If these times do not work for you, email me and we can arrange alternate options.

Student Hours: Please review eClass for more information.

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.

Office Location: 102B Life Sciences Building (LSB)

Class Times: Monday & Wednesday, 11:30 a.m. – 1:00 p.m.

Class Location: ACW 109

[Click here for visual directions.](#)

Study Spaces on Campus:

<https://currentstudents.yorku.ca/study-spaces>

Course TAs: TBA

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Land Acknowledgement

York University recognizes that many Indigenous Nations have longstanding relationships with the territories upon which York University campuses are located that precede the establishment of York University. York University acknowledges its presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, and the Huron-Wendat. It is now home to many First Nation, Inuit, and Métis communities. We acknowledge the current treaty holders, the Mississaugas of the Credit First Nation. This territory is subject of the Dish with One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.

Welcome to this Course!

Course Calendar 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

Course level learning objectives

Upon successful completion of this course, students should be able to:

1. Identify major classes of biological molecules and their polymers by their chemical structure
2. Describe the chemical properties of proteins, nucleic acids, carbohydrates, and fatty acids, and the details of their metabolism
3. Describe the mechanisms by which biological molecules and systems are regulated and coordinated in normal and diseased states
4. Describe the relationship between energy and biological processes, and know how organisms utilize and store energy
5. Describe the mechanisms by which cells store and express genetic information
6. Explain and interpret data from the various biochemical contexts taught in class
7. 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. Therefore, in order to be as successful as possible, each student should study both the material presented in lectures and in the assigned textbook readings.

Lecture Topics

1. Introduction to chemical bonds
2. Water and Buffers
3. Amino Acids and Protein Structure
4. Enzyme Kinetics and Inhibition
5. Carbohydrates
6. DNA and RNA structure
7. DNA replication and Repair
8. Transcription and Translation
9. Regulation of Gene Transcription
10. Metabolism and Energy Transfer
11. Glycolysis and Gluconeogenesis
12. NADH production
13. Oxidative Phosphorylation
14. Coordination of Metabolism

Inclusive teaching statement:

- This course strives to ensure “All students in the class, the professor, teaching assistants, and any guests should be treated with respect during all interactions.”
- As the instructor, “I am committed to fostering an environment for learning that is inclusive for everyone regardless of gender identity, gender expression, sex, sexual orientation, race, ethnicity, ability, age, class, etc. It is my hope that our class will support diversity of experience, thought, and perspective. I will continually strive to create inclusive learning environments and would therefore appreciate your support throughout the semester.”

Community Guidelines

The following values are fundamental to academic integrity and are adapted from the International Center for Academic Integrity*. In our course, we will seek to behave with these values in mind.

	As students, we will...	As a teaching team, we will...
Honesty	<ul style="list-style-type: none"> Honestly demonstrate our knowledge and abilities on assignments and exams Communicate openly without using deception, including citing appropriate sources 	<ul style="list-style-type: none"> Provide honest feedback on your demonstration of knowledge and abilities on assignments and exams Communicate openly and honestly about the expectations and standards of the course via the syllabus, and with respect to assignments and exams
Responsibility	<ul style="list-style-type: none"> Complete assignments on time and in full preparation for class Show up to class on time, and be mentally/physically present Participate fully and contribute to team learning and activities 	<ul style="list-style-type: none"> Provide timely feedback on your assignments and exams Show up to class on time, and be mentally and physically present Create relevant assessments and class activities
Respect	<ul style="list-style-type: none"> Speak openly with one another, while respecting diverse viewpoints and perspectives Provide sufficient space for others to voice their ideas 	<ul style="list-style-type: none"> Respect your perspectives even while we challenge you to think more deeply and critically Help facilitate respectful exchange of ideas
Fairness	<ul style="list-style-type: none"> Contribute fully and equally to collaborative work, so that we are not freeloading off others Not seek unfair advantage over fellow students in the course 	<ul style="list-style-type: none"> Create fair assignments and exams, and grade them in a fair, and timely manner Treat all students equitably
Trust	<ul style="list-style-type: none"> Not engage in personal affairs while on class time Be open and transparent about what we are doing in class Not distribute course materials to others without authorization 	<ul style="list-style-type: none"> Be available to all students when we say we will be Follow through on our promises Not modify the expectations or standards without communicating with everyone in the course
Courage	<ul style="list-style-type: none"> Say or do something when we see actions that undermine any of the above values Accept a lower or failing grade or other consequences of upholding and protecting the above values 	<ul style="list-style-type: none"> Say or do something when we see actions that undermine any of the above values Accept the consequences (e.g., lower teaching evaluations) of upholding and protecting the above values

² This class statement of values is adapted from Tricia Bertram Gallant, Ph.D.






Learning Materials

Textbook: Campbell, Farrell, McDougal (2018). *Biochemistry*. 9th Edition. Cengage Learning

Other readings may be assigned during the course and will be made available to you.

Website (eClass): <http://eclass.yorku.ca/>

Technology Checklist:

 <p>An internet-enabled computer to access eClass and materials</p>	 <p>Zoom software installed on computer</p>	 <p>Access to reliable internet</p>	 <p>Webcam</p>	 <p>Microphone</p>
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Note: If you don't have access to a computer, webcam, microphone, consider [borrowing a laptop from York U, financial aid from York, and \[single workspaces available for student use on campus at the library.\]\(https://www.library.yorku.ca/web/ask-services/printing-and-computing/computing/public-computers-labs/\)](#) (<https://www.library.yorku.ca/web/ask-services/printing-and-computing/computing/public-computers-labs/>)

Assessment in this Course

Research about learning strongly suggests that the most important factor in learning is doing the work of reading, writing, recalling, practicing, synthesizing, and analyzing. Learning happens best when people actively engage material on a consistent basis, and that is why we have high standards in this course. We are confident that, with appropriate effort, you **all** can meet those standards.

When possible, we also try to reduce unintentional bias in grading by, for example, grading assignments one question at a time (grading all of question 1 before grading any of question 2), grading anonymously, and using rubrics. These also help improve consistency in marking.

Crowdmark guidelines will be outlined along with assessments. Please note, for assessments students are required to attend in-person, students will not be granted permission to write an online test or exam.

Grade Breakdown

COMPONENT	GRADE VALUE
ONLINE QUIZZES	10%
MIDTERM 1	20%
MIDTERM 2	20%
PEER-ASSESSED WRITING PROJECT	10%
'COMPOSE A MC QUESTION' ASSIGNMENT	5%
FINAL EXAM	35%

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 the best three completed quizzes will count

towards your grade, and 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.

QUIZ #	OPENS	CLOSES
1	Sep 19	Sep 25
2	Oct 3	Oct 9
3	Oct 24	Oct 30
4	Nov 7	Nov 13
5	Nov 21	Nov 27

Assignments

Full assignment descriptions and marking rubrics will be posted on eClass.

Peer-assessed writing project: For this assignment, you will 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 three anonymous peers from the class, and you will review three 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 **November 25**, and the reviews will be due on **December 5**. The project will be administered using eClass. The date the submission will be available for peer review will be posted on eClass.

“Compose an MC question” assignment: As you study for the midterms and final exam, you will compose your own multiple-choice (MC) questions that you believe could be used on these evaluations. For each assignment, you will compose four MC questions (with 4-5 answer options each) and submit them to eClass. The deadlines for each submission will be October 16, November 20, and December 5. No deadline extensions will be provided, regardless of the circumstances. By the end of the semester, you will have submitted a total of twelve unique MC questions. They will be reviewed by the TA. Only valid MC questions will be accepted (please do not submit random text).

ASSIGNMENT	GRADE VALUE	DUE
MC QUESTION 1	5%	Oct 16
MC QUESTION 2		Nov 20
MC QUESTION 3		Dec 5
PEER-ASSESSED WRITING PROJECT	10%	Nov 25, Dec 5

Midterm Exams

Midterms will be held during the scheduled lecture period. More details will be posted on eClass.

Missed midterm policy:

If you miss the midterm (for any reason), the weight will also be automatically be redistributed. Please do not submit any documentation. There will be no make-up midterms.

MIDTERM	GRADE VALUE	DATE
1	20%	Oct 17
2	20%	Nov 21

Final Exam

The exam will be cumulative and will take place during the Final Exam period. The date and time of the exam will be announced by the Registrar's Office. It is the student's responsibility to check the Registrar's Office website for final exam schedule. More information about the exam will be provided towards the end of the semester.

Regrading/Reappraisal Procedures

For all re-grading requests, please submit your request via the reappraisal form on eClass. In this form you will be asked to include your (1) Your Name and Student Number, (2) A summary of the request (e.g., the total was miscounted), and (3) a copy of the assessment within one week of the material being made available to you. If it is determined that you have provided sufficient academic grounds, the material will be regraded. We will strive to review all re-grading requests within 3 weeks. 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.

We appreciate that grades are important to you and all your classmates. To be fair and consistent with the entire class, individual grades are not negotiable. We cannot provide "extra credit" assignments.

Policy for Recording Lectures

Photographs or video recordings of any portion of the lectures (including slides) are not permitted.

Images and material presented are subject to Canadian copyright law.

Audio recordings are permitted provided they are used only as a personal study aid. They may not be sold, passed on to others or posted online. Remember the lectures are the intellectual property of the professor and cannot be distributed without permission. Lectures can only be recorded from

your seat. No recording devices are permitted at the front of the room, including front table(s), the lectern and computer area.

Lecture slides are posted on the website and are for personal use only. They may not be sold, passed on to others or posted online.

University Policies

Important Dates

Last Day to drop the course without receiving a grade: November 11, 2022

Last Day to withdraw from the course and receive “W” on transcript: December 7, 2022

Grading Scheme

In accordance with the York University Undergraduate Calendar Regulations, the letter grades assigned in undergraduate courses at York conform to the descriptions and grade ranges shown here: <https://calendars.students.yorku.ca/2022-2023/grades-and-grading-schemes>

Academic Honesty and Integrity

Academic misconduct undermines the values of honesty, trust, respect, fairness, and responsibility that we expect in this class. York University provides supports such as academic integrity workshops to ensure that all students understand the norms and standards of academic integrity that we expect you to uphold.

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. Please review and familiarize yourself with the policy.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve your research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website:

Examples of actions that do not adhere to York’s Academic Integrity Policy include:

- Plagiarism (passing off someone else’s work as your own)
- Accessing unauthorized sites for assignments or tests
- Unauthorized collaboration on assignment and exams
- Uploading work to third party repository sites (e.g., Course Hero, One Class, etc.)
- Scanning, sharing, uploading, or publishing exams, tests, or scholarly work

For more information on what academic integrity is and why it is important see:

<https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/>. Information on the

process of investigations into breaches of academic honesty:

<https://spark.library.yorku.ca/academic-integrity-breach-of-policy-on-academic-honesty/>

Important Note from the FSc Committee on Examinations & Academic Standards (CEAS):

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. Whenever a student submits work obtained through an external site (e.g., Course Hero, Chegg), the **submitting student will be charged with plagiarism** and the **uploading student will be charged with aiding and abetting**. To avoid this risk, students are urged not to upload their work to these sites.

Assistance for Students (Academic and Well-Being)

Academic Advising*: <https://www.yorku.ca/science/academic-advising/> * Departments also offer program-specific advising. Check with your Department's Undergraduate Office.

Centre for Human Rights, Equity, and Inclusion: <https://rights.info.yorku.ca>

Centre for Indigenous Students Services: <https://aboriginal.info.yorku.ca/>

Good2Talk 24-hour Ontario Student Helpline: 1-866-925-5454 /Text: GOOD2TALKON to 686868

Keep.meSAFE: <https://myssp.app/keepmesafe/ca/home>

Learning Commons (general academic learning supports including library research, time management, study skills, career planning, etc.): <https://learningcommons.yorku.ca/>

Peer Assisted Study Sessions (PASS): <https://www.yorku.ca/colleges/bethune/get-help/pass/>

Peer Tutoring: <https://www.yorku.ca/colleges/bethune/get-help/peer-tutoring/>

Sexual Violence Response and Support: <https://thecentre.yorku.ca>

Student Counselling, Health & Well-being: <https://counselling.students.yorku.ca/>

Support Services for International Students: <https://yorkinternational.yorku.ca/international-student-support/>

Writing Services: <https://www.yorku.ca/colleges/bethune/get-help/writing/>

York University Student Services: <https://family.yorku.ca/student-services/#SCD>

York University Student Well-being Resources: <https://www.yorku.ca/well-being/resources/students/>

Accessibility

York University is committed to principles of respect, inclusion, and equality of all persons with accessibility needs across campus. The University provides services for students with accessibility needs (including physical, medical, learning, and psychiatric needs) 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 accessibility 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 accessibility 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:

Student Accessibility Services: <https://accessibility.students.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. 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 accommodation request form at least 3 weeks before the exam period begins. <https://secure.students.yorku.ca/pdf/religious-accommodation-agreement-final-examinations.pdf>

Student and Instructor 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/>.

Academic accommodation refers to educational practices, systems and support mechanisms designed to accommodate diversity and difference. The purpose of accommodation is to enable students to perform the essential requirements of their academic programs. At no time does academic accommodation undermine or compromise the learning objectives that are established by the academic authorities of the University.

University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university's website, here:

<https://calendars.students.yorku.ca/2021-2022/policies-and-regulations>

Course Overview

Please note that the following is a tentative schedule of topics covered and represents a tentative guide only; this is not a complete and exhaustive list of topics covered and is subject to change both in the topics covered as well as the schedule of topics.

Chapter	Monday	Tuesday	Wednesday	Thursday	Friday
September					
Intro, Ch. 1	5	6	7	8	9
Ch. 2, 3	12	13	14	15	16
Ch. 4, 6	19	20	21	22	23
Ch. 7, 16	26	27	28	29	30
October					
Ch. 9	3	4	5	6	7
No Classes	10 Reading Week	11 Reading Week	12 Reading Week	13 Reading Week	14 Reading Week
Ch. 13	Midterm 1 17	18	19	20	21
Ch. 5, 15	24	25	26	27	28
November					
Ch. 17, 19	Oct. 31	1	2	3	4
Ch. 20, 18	7	8	9	10	11
Ch. 10, 11	14	15	16	17	18
Ch. 12	Midterm 2 21	22	23	24	25
Ch. 12, 21	28	29	30	Dec. 1	Dec. 2

December

Ch. 23	5	6	7	8	9
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