

COURSE OUTLINE

Instructor: Prof. B. Findlay

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Office hours: Tuesday 4:00 – 5:00 and Wednesday 3:00 – 4:00 (zoom), or by appointment.

Class Zoom room: <https://concordia-ca.zoom.us/j/83662065892>

INTRODUCTION

Biochemistry is the study of chemical molecules and chemical reactions in living organisms. Examples of important molecules are carbohydrates, lipids, proteins, and nucleic acids. In this course we will cover the structures and properties of carbohydrates and proteins as well as some introductory metabolism. A living cell has to be able to provide the building blocks for all the important structures of the cell and the energy needed to carry out metabolic processes. A cell must take up nutrients and get rid of waste. Cells need to be able to interact with other cells in a multicellular organism. In this course we will begin to look at some of these cellular processes, mainly how the cell uses glucose to provide energy, and how energy can be stored in the form of carbohydrates. It is important to remember that biochemistry is an experimental science, so we will also cover the theory behind some common techniques. The lab part of the course will provide you with an opportunity to use some of these techniques yourselves.

TEXTBOOKS and ONLINE PROBLEM SETS

Required: J.M. Berg, J.L. Tymoczko, G.J. Gatto, Jr., and L. Stryer, *Biochemistry*, 10th ed., W.H. Freeman and Company. (9th, 8th, and 7th ed also acceptable, copies are available in the Vanier library reserve room).

Required: CHEM 271: Laboratory and tutorial manual. (You must use this year's edition as the content from previous years is not the same!)

SCHEDULE

Lecture date	Topic	Berg <i>et al.</i> Biochemistry
		10 th ed.
Jan. 13	Introduction, amino acids	1, 2
	Amino acids, peptides and pH	1, 2
Jan. 20	Proteins (secondary structure)	2, 10
	Proteins (higher order structure)	2
Jan. 27	Hemoglobin	3
	Purifying proteins	4
Feb. 3	Characterizing proteins	4
	Enzymes: basic concepts	5
Feb. 10	Enzymes: kinetics	5
	CLASS TEST 1	
Feb. 17	Introduction to metabolism	15
	Enzymes: inhibitors	5
Feb. 24	Enzymes: mechanisms	6
	Enzymes: regulation	7
Mar. 3	READING WEEK	

	(No classes)	
Mar. 10	Carbohydrates	11
	Glycolysis	16
Mar. 17	Glycolysis	16
	CLASS TEST 2 (Weeks 4-8)	
Mar. 24	Glycogen metabolism	21
	Glycolysis and Gluconeogenesis	16
Mar. 31	Citric acid cycle	17
	Citric acid cycle/Bioenergetics	17, 13, 18
Apr. 7	Electron transport chain	18
	ATP Synthesis	18

Genbank assignment due at the start of lecture March 17th. A 10% late penalty will be applied to assignments received after this date.

GRADING

Tutorials and labs	25%
On-line quizzes	5%
Class tests	35% (15+20 or 20+15, whichever is higher overall grade)
Final	35%

If you miss a class test and have a valid excuse, you may ask for my permission to write a make-up test. This will be given only once, one week after the scheduled class test during class time. If you miss the make-up test you will receive a grade of 0 for that test. If you cannot write the final exam, you must make arrangements with the examination office to write a deferred exam. The final is mandatory.

Please note that space in the labs and tutorials is limited, so you **must follow the schedule of the group you have been assigned to**. Your section can't be changed. To accommodate all of the students each lab/tutorial section has been divided into two groups (A or B). The two groups will alternate between labs one week and tutorial the other week. You will be informed through email as to which group you have been placed in. If you have a **valid** reason to switch groups, please contact the lab coordinator, Mr. Hai Tao Yan (haitao.yan@concordia.ca).

For each lab you will have to hand in a short lab report. The marks for the tutorials will be based on quizzes and assignments. There are 11 elements and one (lowest mark or medical exemption) will be dropped. The remaining 10 will be scaled to a mark out of 25. If you are absent from the lab or the tutorial you may not hand in the reports or assignments or do the quizzes. You will be assigned a grade of 0 for that particular part. In order to pass the course, **YOU MUST PASS THE LAB COURSE** with at least a grade of 60%. If you do not receive a grade of 15/25, your final grade will be R, which means you have to repeat the course.

Lab exemptions: Students who are repeating the course, and have passed the lab component within the past two (2) years, may request a lab exemption. Applications for the exemption (forms available in SP201.01) must be completed by noon January 13th, the end of the first week of term (*i.e.* prior to the start of the laboratory); late applications will not be accepted. Signed and completed forms are to be returned to Ms. Lisa Montesano, (SP 275.01). Students **MUST** register for the appropriate lab exemption lab/tutorial section; students registered in any other lab/tutorial sections will be required to complete the lab portion of the course (**NO EXCEPTIONS**).

Online quizzes: Quizzes are located on Moodle and are worth 5% of your overall grade.

ACADEMIC CONDUCT AND CHEM101

The academic code of conduct can be found in section 17.10 of the academic calendar (<http://www.concordia.ca/academics/undergraduate/calendar/current/17-10.html>) (<http://www.concordia.ca/students/academic-integrity.html>). Any form of academic misconduct found in this course will be reported and the appropriate sanctions applied.

As part of your CHEM course, you are **required** to i) attend a Chemistry and Biochemistry Departmental Seminar on the academic conduct code and the appropriate use of information sources and ii) pass the online quiz associated with this seminar (the passing grade for the quiz is 100%). (Note: this quiz is graded by the Department of Chemistry and Biochemistry, and you do not have access to it until after you have attended the seminar. Therefore, any other quiz you may have taken on the academic code of conduct does not count toward the CHEM 101 requirement.) The aim of this seminar and quiz is to clarify the academic conduct code in terms of which practices will be considered unacceptable with regards to work submitted for grading in your CHEM course. **You are only exempt from repeating the seminar and the quiz if you have done both in Winter 2021 or more recently,*** otherwise you are required to repeat both this term. This short seminar (1 hour) will be held at the following times (note that you will not be given credit if you join too late and/or leave too early):

Date (Winter 2026)	Time	Mode	Registration link
Jan. 27 (Tuesday)	21:00-22:00	Zoom	https://concordia-ca.zoom.us/join/abB53MlnQSC6LrNsCnRepw
Jan. 29 (Thursday)	21:00-22:00	Zoom	https://concordia-ca.zoom.us/join/0v3k0gZLTgGLTXRYpNJ7zg

As space for each of the Zoom seminars is limited, please **register early** for your preferred slot (copy the corresponding link above into your browser). **Look out** for the confirmation email from us (Elizabeth Montesano) with the link to the actual seminar. Then do not forget to **attend** that seminar slot on the date above: put it into your scheduler/agenda. You will **not** receive a reminder on or before the date!

We will take attendance at the Zoom seminar; this means that you must log in with the code that was supplied for your registration. Do not “join a friend” in watching at their computer.

If you do not complete this course requirement, your final grade for the course may be lowered by one full letter grade with an incomplete (INC) notation until such time as this requirement is completed. Please refer to the undergraduate calendar (section 16.3.5) for details on removal of an incomplete notation.

* You are exempt if you can locate your ID in the pdf file located on the Departmental web site (<http://www.concordia.ca/content/dam/artsci/chemistry/docs/Compliance-list.pdf>) and if there is no entry in the “quiz” column for you. If the list does not say “Winter 2021-Fall 2025”, you have the wrong list: clear your browser data.

Generative AI: The use of generative AI (e.g. ChatGPT) is not prohibited in this course. However, students must indicate if their text contains AI-generated elements. Failure to do so will constitute an academic code violation, similar to a failure to appropriately cite a textbook or other literature source. Students may also be charged with a code violation if the AI fails to appropriately cite sources, either through omission or through the creation of fictitious references.

The University offers many services that can help students:

Concordia Counseling and Development offers career services, psychological services, student learning services, *etc.* – <http://www.concordia.ca/offices/cdev.html>

The Concordia Library Citation and Style Guides:
<http://library.concordia.ca/help/howto/citations.html>

Advocacy and Support Services – <http://www.concordia.ca/offices/advocacy.html>

New Student Program – <http://www.concordia.ca/offices/cdev.html/our-services/services-for-new-students/>

Students with Disabilities – <http://www.concordia.ca/offices/acsd.html>

Student Success Centre – <http://www.concordia.ca/offices/cdev.html/our-services/resources-and-drop-in-centres/>

Financial Aid & Awards – <http://www.concordia.ca/offices/faao.html>

Health Services – <http://www.concordia.ca/students/health.html>

If you need help, reach out!