CHEMISTRY 375 **BIOCHEMISTRY II** Winter 2024

Professor: Dr. Lena Sahlman
Office: SP 275.35
Phone: 514-848-2424 ext. 3339
Office hours: Monday 16:00 – 17:00, Thursday 9:00-10:00, by appointment or drop-in.
E-mail: lena.sahlman@concordia.ca

WEB RESOURCES: There is a Moodle web site set up for this course as well as one for the lab component.

TEXTBOOK: *Biochemistry,10th edition*, by J.M. Berg, G.J. Gatto, Jr., J.K. Hines, J.L. Tymoczko, and L. Stryer. (9th edition also acceptable)

TEXTBOOK READING
We will cover the following chapters of the textbook:

Chapters: 15 and 24, mostly review
Chapters: 12, 19, 20, 22, 23, 25, 26, 27, 30, and a few pages of Chapter 31

GRADING:

Laboratory:	20%
Achieve homework:	5% (0%)*
Class tests (2):	40% (best=25%, worst=15%)
Final Exam:	35% (40%)*

* If counting the final exam for 40% and the Achieve homework for 0% ends up being higher, then the mark for the Achieve homework will be disregarded.

Unforeseen circumstances may lead to changes in the grading scheme.

LABS
Dr. Neema Chirwa is in charge of the labs

PLEASE NOTE THAT YOU MUST PASS THE LABS TO PASS THE COURSE!
(passing grade = 12/20)

LAB REPORTS MUST BE YOUR OWN WORK!
There is a 10% penalty ***per day*** for late lab reports. **Only** the professor may give extensions, and then only for a good reason (e.g. sickness).

Attendance at labs is mandatory. Absence from a lab will result in a mark of 0. The professor may accept a valid reason for one absence. You may then be allowed to do a make-up lab, or retrieve data from your lab partner. No excuses will be accepted for a

second absence. If you are absent for more than two labs, whether with a valid reason or not, you will receive a grade of R, meaning you have to repeat the course.
Being late for a lab is not acceptable. If you are more than 15 minutes late, you will not be admitted into the laboratory and your absence will be noted down.

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 on the Chemistry and Biochemistry website, http://www.concordia.ca/artsci/chemistry/programs/undergraduate/procedures-forms.html) must be submitted by 4 pm on January 19th, 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 should be sent to Ms. Elizabeth Montesano at chemistry.reception@concordia.ca. 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**).

Note: if you end up discontinuing this course (DISC), you will not be eligible for a lab exemption if you take the course again.

ACHIEVE HOMEWORK

Access to Achieve homework is through the textbook. If you have purchased Achieve access for more than one term, you will be able to use the same code for this course as for CHEM 271. Quizzes will be assigned on a regular basis and will account for 5% of your grade.

CLASS TESTS AND FINAL EXAM

The dates of the class tests are indicated in the class schedule (below). If you are sick that day, you **may ask for permission** to write the make-up test. One make-up test will be given, during class time 1 week later than the scheduled test. No excuses will be accepted for missing the make-up test. You will receive a grade of 0 for that test.

The final exam will be administered by the exams office. You will need to contact them in order to write a deferred exam if you are unable to write the scheduled final exam.

OBJECTIVES

We will survey the metabolism of carbohydrates (other than glucose), lipids, amino acids and nucleotides. The chemistry involved will be emphasized throughout, and the underlying logic discussed. Mechanisms of metabolic regulation, and the integration of the various pathways will be covered in an attempt to unify the diverse reaction sequences encountered throughout the course. The emphasis will be on understanding the metabolic principles, rather than on being able to memorize metabolic pathways. A section on protein biosynthesis will complete the course.

LECTURE SCHEDULE, tentative

January 15	Introduction and review of metabolic concepts, Experimental approaches; reaction types
January 22	Photosynthesis, light reaction, Calvin-Benson cycle and C_4 pathway
January 29	Pentose phosphate pathway, Selected coenzymes; fatty acids and triacylglycerols
February 5	Fatty acid oxidation, Fatty acid biosynthesis
February 12	**Class Test 1**
	Phospholipids
February 19	Sphingolipids and eicosanoids, Cholesterol biosynthesis
February 26	*Midterm Break*
March 4	Steroid biosynthesis and action, Lipoproteins and lipid transport
March 11	**Class Test 2**
	Protein turnover**;** ammonia-utilizing enzymes
March 18	Urea cycle; amino acid degradation, Nitrogen fixation; amino acid biosynthesis
March 25	Amino acid biosynthesis; 1-carbon metabolism, Pyrimidine metabolism
April 1	University closed, no class
April 8	Purine metabolism, Deoxyribonucleotide synthesis; ribonucleotide reductase
April 15	Protein biosynthesis

PLAGIARISM AND OTHER FORMS OF ACADEMIC DISHONESTY

The Academic Code of Conduct can be found in section 17.10 of the academic calendar (https://www.concordia.ca/conduct/academic-integrity.html). Any form of unauthorized collaboration, cheating, copying or plagiarism found in this course will be reported and the appropriate sanctions applied. The Department of Chemistry and Biochemistry offers a seminar on the academic conduct code and the appropriate use of information sources which aims to clarify what practices will be considered unacceptable with regards to work submitted for grading in Chemistry and Biochemistry courses. The mandatory seminar is a clear and fair opportunity to learn what our faculty regards as academic misconduct. Failure to take part in this learning opportunity and thus ignorance of these regulations is no excuse and will not result in a reduced sanction in any case where academic misconduct is observed.

As part of CHEM 375, you are ***required*** to i) attend a Chemistry and Biochemistry Departmental Seminar on the academic conduct code and the appropriate use of information sources ("CHEM 101") 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.)

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 2024)	**Time**	**Mode**	**Registration link**
Jan. 30 (Tuesday)	21:00-22:00	Zoom	https://concordia-ca.zoom.us/meeting/register/tZEpduiqqj8rHNA4t_dWhFwnImOSHyjND38f
Feb. 1 (Thursday)	21:00-22:00	Zoom	https://concordia-ca.zoom.us/meeting/register/tZIvf-ysrz8pGNFJEOnE8CqWvRYv_ADZ4arT

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 Zoom email with the link to the actual seminar. Then do not forget to **attend** that seminar slot on the date above. 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 from repeating the seminar and the quiz if you have done both in Winter 2019 or more recently, otherwise you are required to repeat both this term. 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.