Biology 266/2 section 01, Fall 2021

Lectures: Wednesday and Friday, 10:15-11:30

Tutorials: Wednesdays and Fridays, 13:15-14:30 and 14:45-16:00 in CC-101. Note that you must register for one of these 4 sessions and attend the one you registered for. Attendance will be taken. Do not attend a different section without permission of the instructor. This will only be granted under exceptional circumstances.

Lecture room: SP-S110

Instructor: Dr. Michael Sacher

Email: michael.sacher@concordia.ca
(I generally respond to emails within 24 hours. If you do not get a response, feel free to email again, pass by during office hours, or catch me at the end of a lecture)

Office: SP-457.01

Office hours: Thursdays and Fridays, 12:00-13:00 or by appointment

TA information: (to be posted on the course Moodle site)

Course description: As a 200-level cell biology course, you will be introduced to basic concepts and techniques in the field. Emphasis will be placed on the organization of the cell, communication between cellular compartments, signaling pathways, cellular division and its regulation, and cancer. We will also cover basic techniques such as microscopy and how these techniques are used to understand the inner workings of a cell. You will also be exposed to the vast vocabulary necessary to prepare you for in-depth discussions in other courses.

Learning outcomes: By the end of the course you should be able to:
identify the compartments of a cell, describe the main functions of these compartments, explain how cells produce energy, explain how cells divide and how that division is regulated, explain how proteins enter the organelles of a cell and how they move between different organelles, identify the main components of a microscope and describe how an image is produced, understand how events in one location of a cell influence those in another location, explain how cells communicate and how signals are transduced from outside of the cell to inside, understand the key features of biological macromolecules such as lipids, proteins and nucleic acids.

Lecture notes and recordings: The lecture notes will be posted on the Moodle course website in three sets. Units 1-3 will be posted at the start of the semester, Units 4-8 will be posted after the first midterm exam, and Units 9-13 will be posted after the second midterm exam. The notes will be posted in colour.

The lectures will be recorded and the slides/audio will be posted on the Moodle course website shortly after each lecture. Although the microphone should not pick up any sound other than the lecturer, it is possible that students' questions during class may be picked up. Please speak to the instructor if this will be an issue.

The recorded lectures and lecture notes are meant for the registered students of this section. Any sharing of the notes or recordings is a violation of both Copyright law and the Academic Code of Conduct (http://tinyurl.com/j9q26vm). Violations of either one will result in severe penalties.

The recorded lectures are meant to be used as review material. Studies indicate that students who attend and are engaged in lectures perform better than those who do not. To simply rely on the lecture notes and recorded lectures in place of attendance would be a grave mistake. Please make sure to use them for the purpose that they are intended.

Note that photography of any type is strictly forbidden in this class. Anyone caught taking any type of photo in the lecture or tutorial will incur immediate and severe penalties including, but not limited to, grade reduction that may result in a failing grade in the course. An Academic Code of Conduct report will also be filed and, if upheld, will remain as a permanent notation on your transcript. In short, don't do it.

Marking scheme:

Smartwork 5 questions	5% (correct responses and participation)
In-class TopHat questions	5% (correct responses and participation)
Tutorials	10% (attendance and participation)
Term tests	20% each***
Final exam	40%***

***Alternative grading scheme*

> If the final exam is higher than at least one of the term tests, then the final exam is worth 50%, the lowest term test is worth 10% and the other term test is worth 20%. **Note that this alternative scheme only applies to students who write both midterm exams.**

If you cannot attend one of the term tests, a valid medical note must be presented to the instructor within one week of the exam. In such a case, if the note is deemed acceptable, the final exam will be worth 60% and the written term test will be worth 20%. All other marks remain unchanged. Note that medical notes that are vague (e.g. "…was seen in the clinic today") will not be considered acceptable. Ask your medical professional to be specific as to why you could not write your exam at the specified time. If the note is not deemed acceptable, the original marking scheme applies with the missed term test being worth 20% and no alternative grading scheme will apply. If you cannot attend the final examination for a valid reason, you must contact the Examinations Office to schedule a deferred examination. Vacations and travel plans are not considered a valid reason for a deferral or for a missed term test.

The first term test will cover Units 1-3 and the second term test will cover Units 4-8. The Final exam is cumulative with a slightly stronger emphasis (~60%) on the material covered after the second term test. All examinations will include material covered in the lectures, tutorials and the lecture notes. The exams will be mainly multiple choice questions with a few short-answer questions.

Grades: The following guidelines will be used for assigning the final grade in the course:

A+	90-100	C+	67-69
A	85-89	C	64-66
A-	80-84	C-	60-63
B+	77-79	D+	57-59
B	74-76	D	54-56
B-	70-73	D-	50-53

Note that a grade below 50 is considered failing for this course.

In-class questions/participation: We will be using the Top Hat (https://www.tophat.com) classroom response system in class. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message.

You can visit the Top Hat Overview (https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide) within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system. An email invitation will be sent to you, but if do not receive this email, you can register by simply visiting our course website:
https://app-ca.tophat.com/e/285651
Note: our Course Join Code is 285651

Top Hat requires a paid subscription, and a full breakdown of all subscription options available can be found here: https://www.tophat.com/pricing. Note that I have secured a special reduced price ($16) for purchasing TopHat for this semester only.

Should you require assistance with Top Hat at any time, please contact their Support Team directly by way of email (support@tophat.com), the in app support button, or by calling 1-888-663-5491. The instructor cannot be of assistance for Top Hat troubleshooting since they require specific user information to troubleshoot issues

For those who are not familiar with this format, I will pose questions during class. You will then use Top Hat to register your response. You will be graded on your responses over the course of the semester. Depending on the responses, you may be asked to break into small (~4 people) groups to discuss the question and re-respond. Top Hat questions and discussions will not be recorded nor posted in the lecture notes. The grades will be a combination of correct answers and attendance (stronger weight attributed to attendance). You must attain at least 80% of the points over the semester in order to obtain the full marks. This takes into account missed classes, forgotten/lost devices and dead batteries so no need to ask me about such situations.

You will also be able to view the lecture notes in Top Hat if you like. The notes will also be posted on the course Moodle site. Viewing through Top Hat might be preferred since in class-questions will come through Top Hat.

Text: "*Essential Cell Biology*" by Alberts et al, 5th edition, Norton Publishing, Inc. (2018). You may purchase either the e-book, the loose-leaf version or just access to the Smartwork 5

question system. Both books come with access to the online Smartwork 5 system that we will be using. I strongly recommend having the e-book since it is nicely integrated with the Smartwork 5 system. Pre- or post-lecture questions will be posed using this system and this will be the only way to obtain the points for this portion of your grade. **It is strongly recommended that you read through the relevant sections of the text before coming to class.**
Smartwork 5 code for this course: 442061

"*Karp's Cell and Molecular Biology*" by Iwasa and Marshall, 8th edition, John Wiley and Sons, Inc. (2016), is a good supplement to the required text. It should be on reserve at the library.

Other useful texts include "*Molecular Cell Biology*" by Lodish et al, 8th edition (W. H. Freeman and Company, 2016) and "*Molecular Biology of the Cell*" by Alberts et al, 6th edition (Garland Publishing, Inc, 2015).

Tutorials: The tutorials will consist of practice questions in some weeks and case studies in others. The case studies will be based on material covered or to-be-covered in the lectures and will dive much deeper, and likely beyond your level, into the material. In all cases you will be expected to organize into groups of 4 to answer the questions or to examine the case study. Case studies will involve some information to be delivered by the TA, short videos with explanations of some material, as well as exposure to primary literature where you will be expected to analyze data and arrive at conclusions. For most of you this will be your first exposure to reading a scientific paper. Therefore, we will not read the entire paper, but portions will be highlighted for you to focus on. The tutorials will be designed to pique your curiosity in science and to demonstrate the applicability of the material covered in this course. Worksheets must have all names and ID numbers of students in your group for that week. If your worksheet has more names than people in your group, all members of that group will not receive credit for attendance and will be subject to further disciplinary action. Practice questions will be based on material in the class but will be extremely challenging and require you to think more deeply about the material as well as to perform some calculations and data analysis. The first part of those tutorials will be devoted to working on the practice questions while the second part will be devoted to discussing the answers. Many have stated that the tutorials are too hard. That is precisely the point. You are graded on attendance and participation, not on getting correct answers. What better way to be pushed out of your comfort zone and not be required to be correct? Future cell biology courses will push you for a deeper understanding but will grade you on getting the correct answer, so consider this the "on-deck circle".

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Units by approximate lecture dates

Date	Unit	Topics	Essential Cell Biology	Tutorials	Tutorial activity
September 8***	1	Cells and organelles (I)	Ch. 1, 13, 14	none	-----
September 10	1	Cells and organelles (I)	Ch. 1, 13, 14		
September 15	1	Cells and organelles (II)	Ch. 1, 13, 14	Sept 15 and 17	"*A Perfect Storm*"
September 17	1	Cells and organelles (II)	Ch. 1, 13, 14		
September 22***	2	How cells are studied (I)	Ch. 1, 4	Sept 22 and 24	practice questions
September 24	2	How cells are studied (I)	Ch. 1, 4		
September 29***	2	How cells are studied (II)	Ch. 1, 4	Sept 29 and Oct 1	"*Dying To Lose Weight*"
October 1	2	How cells are studied (II)	Ch. 1, 4		
October 6	3	Membrane structure	Ch. 11	Oct 6 and 8	practice questions (review methodologies before coming to the tutorial)
October 8	3	Membrane structure	Ch. 11		
October 13	4	Membrane proteins	Ch. 4, 11	none, review session Oct 14	-----
October 15	**MIDTERM 1 (UNITS 1-3)**				
October 20	5	Membrane transport	Ch. 12	Oct 20 and 22	"*I Am The Egg Man*"
October 22	6	Protein sorting to organelles (I)	Ch. 15		
October 27	6	Protein sorting to organelles (I)	Ch. 15	Oct 27 and 29	practice questions
October 29	6	Protein sorting to organelles (II)	Ch. 15		
November 3	6	Protein sorting to organelles (II)	Ch. 15	Nov 3 and 5	"*The Heat Is On*"
November 5	7	Principles of cell signaling	Ch. 16		
November 10	8	Signal transduction pathways (I)	Ch. 16	Nov 10 and 12	practice questions
November 12	8	Signal transduction pathways (II)	Ch. 16		
November 17	**MIDTERM 2 (UNITS 4-8)**			none, review session Nov 16	-----
November 19	9	Cytoskeleton	Ch. 17		
November 24	10	Mitosis and cytokinesis	Ch. 18	Nov 24 and 26	"*How To Grow A Tumor*"
November 26	11	Cell cycle control systems	Ch. 18		
December 1	12	Cell cycle checkpoints	Ch. 18	Dec 1 and 3	practice questions
December 3	13	Cancer	Ch. 18,20		

*****Note these lectures will be pre-recorded and posted online since I will be unavailable on those dates**
Topics listed per lecture may differ depending on how quickly they are covered.