Cell Biology (BIOL 2230)
Course Syllabus F2024

Faculty Information

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Professor

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Land Acknowledgement

We respectfully acknowledge that Lakehead University campuses are located on the traditional lands of Indigenous Peoples. Lakehead Thunder Bay is located on the traditional lands of the Fort William First Nation, Signatory to the Robinson Superior Treaty of 1850. Lakehead Orillia is located on the traditional territory of the Anishinaabeg. The Anishinaabeg include the Ojibwe, Odawa, and Pottawatomi nations, collectively known as the Three Fires Confederacy. Lakehead University acknowledges the history that many nations hold in the areas around our campuses, and is committed to a relationship with First Nations, Métis, and Inuit Peoples based on the principles of mutual trust, respect, reciprocity, and collaboration in the spirit of reconciliation.

Calendar Description

Cell Biology. 0-0; 3-1. Methodology used in studying cell structure and composition will be outlined and the following metabolic processes will be discussed in relation to their subcellular localization: energy conversion, DNA replication and gene expression, membrane function, polysaccharide synthesis, and hydrolytic reactions.

General Description

The cell is the fundamental functional unit of all living things. As such, cell theory is one of the major unifying concepts of biology. An understanding of cell biology therefore underlies and contributes to most areas of biology.

This course will focus primarily on the biology of eukaryotic cells, though prokaryotic cells will be mentioned periodically for comparative purposes. We will explore how eukaryotic cells are organized and function at the molecular, biochemical, and sub-cellular levels. This will then allow us to examine the structure, organization, development, and function of multicellular organisms. Techniques and methodological approaches to studying cells will also be discussed in lectures and tutorials. The relevance of cell biology to medical research and human health and disease will also be considered.

"The eukaryotic cell is evolution's major achievement:
multicellular life is merely a crude elaboration."

-Simon Conway Morris

Topics Covered

- Chemistry of the cell;
- Chemical reactions and energetics;
- Proteins and enzymes;
- Methods in cell biology (e.g. microscopy);
- Biomembranes;
- Transport across membranes;
- Organelle structure and function;
- Cellular energetics (i.e. metabolism including cell respiration and photosynthesis);
- Moving proteins;
- Vesicular traffic, secretion, and endocytosis;
- The cytoskeleton;
- Cell division;
- Multicellular organization (e.g. tissues).

Course Learning Outcomes

Upon successful completion of this course, the student will have reliably demonstrated the ability to:

- Understand the organization and functioning of eukaryotic cells and how cells can work together to create multicellular life.
- Describe and explain experimental approaches used to discover and explore the structures and functions of cells.
- Gain practical experience and knowledge of a variety of techniques used to study cells.
- Demonstrate an understanding of the principles of scientific inquiry.
- Demonstrate the ability to think critically and employ critical thinking skills.
- Read and interpret graphs and data.
- Demonstrate the quantitative skills needed to succeed in biology.
- Demonstrate the ability to make connections between concepts across biology.
- Demonstrate the ability to find peer reviewed publications, understand their structure and extract information needed to expand knowledge on a specific topic in cell biology.
- Communicate effectively in writing.
- Having fun with cells!!

By the end of this course you should have developed a basic model of the living cell as it functions in its microscopic world.

Brightspace
All course information is on the *myCourselink (Brightspace (D2L)*) Lakehead University course shell. Students must have access to the course Brightspace to access assignments, quizzes, lessons, labs, etc.

To log into your course website:

1. Go to https://mycourselink.lakeheadu.ca/d2l/home.
2. Enter your Login/ID (your Lakehead University e-mail username) and your Password/PIN number.
3. Click on the course title to enter the course.

If you encounter any difficulties logging into the course site, please contact: mycourselink@lakeheadu.ca.

Textbook
Hardin, J. Bertoni, G., Kleinsmith, L.J. (2016) Becker's World of the Cell (9th ed.) Upper Saddle River, NJ: Pearson Education Inc. (ISBN: 0134157257).

- **The textbook is NOT required.** All tests will be based on lectures and other course materials.
- The textbook is well-written and well- organized and can be a useful resource for Biol 2230

Course textbooks can be ordered online through the Lakehead University bookstore (http://bookstore.lakeheadu.ca/home). Purchases can be shipped to students' home addresses. For more information, contact Lakehead University bookstore (http://bookstore.lakeheadu.ca/contact-us).

Class Schedule

Lecture	Tuesdays and Thursdays	5:30-7:00pm	OA2006
Tutorial	Fridays	11:30am-12:00pm	Zoom

No classes on: Monday, Feb. 19 to Friday, Feb. 23, 2024 (Study Week)
Wednesday, April 9 to Thursday, April 11, 2024 (Exam Preparation Days)
Friday, March 29 and Monday, April 1, 2024 (Good Friday and Easter Monday)

Exam Period runs Friday April 12, 2024 to Monday, April 22, 2024 (Includes two weekends) with Tuesday, April 23, 2024 as a contingency date. This course will have an assigned time period for an exam. Further details to be released.

- This course will be offered in person and you are expected to attend all lectures so you can participate during class and get the most out of each lecture.
- Independent work, including readings, assignments, and discussions, will be assigned to be completed at your leisure.
- A **course schedule** will be provided separately including reading and assignment due dates.

Tutorials
Weekly tutorials are designed to introduce you to some of the common laboratory techniques and methodologies of cell biology. In other words, the tutorials are integrated with the lectures and allow you to apply some of the information and concepts covered during lectures. The tutorials will largely consist of independent work and assignments. See the course schedule and Brightspace for more details.

Grading Scheme and Dates

Component		Value (without option)	
Term Tests (online)			
	Term test 1 (Feb. 29)	= 25%	**= 55%**
	Term test 2 (during exam period)	= 30%	
Online Discussion Forums			
	Introduction forum	= 1.5%	**= 15%**
	Discussion forum 1	= 4.5%	
	Discussion forum 2	= 4.5%	
	Discussion forum 3	= 4.5%	
Tutorials			
	Tutorial 1: Cells! Cells! Everywhere!	= 8%	**= 30%**
	Tutorial 2: Microscopy	= 8%	
	Tutorial 3: Cell fractionation	= 8%	
	Tutorial 4: Reading about cells	= 6%	
Total		**= 100%**	

Exam and Assignment Policies

Term Test Policies: Term tests will consist of a variety of question types possibly including multiple choice, mix-and-match, true/false, diagrams, and short answer. Term tests are non-cumulative, but it should be understood that material covered prior to the test may be included indirectly if it is essential to the understanding of the topics being tested. All term tests will be written online via the course Brightspace page. More detailed instructions will be provided.

A student who misses a term test will receive a zero. Exceptions to this policy may be granted at the discretion of the course director if either a medical or family emergency occurs and documentation is provided. Failure to make contact within 48 hrs. will result in a forfeiture of any opportunity to do a re-write. In the event of a missed term exam the value of the exam will be redistributed to the next term test.

Assignment Due Date Policies
Assignment due dates are indicated in the course schedule and on the course Brightspace page. Assignments submitted past the due date will be deducted 10% each day for 5 days after which the student will receive a grade of 0%. Exceptions to this policy may be granted at the discretion of the course director if either a medical or family emergency occurs and documentation is provided. It is your responsibility to contact the course director.

No Extra Credit: There is no possibility of **extra credit** (i.e. doing extra work if you did not do well on something) to increase your mark either during the term or after the final exam. Anyone receiving a final course grade of 49% will **automatically** have their final exam re-graded

However, if you do run into time constraints or other difficulties during the semester, I encourage you contact me by email, and I will work with you to find a solution.

Learning Environment

Everyone learns more effectively in a respectful, safe, and equitable learning environment free from discrimination or harassment. I invite you to work with me to create a classroom space—both real and virtual—that fosters and promotes values of human dignity, equity, non-discrimination and respect for diversity. These values and practices are in accord with the Lakehead University Equity, Diversity, and Inclusion Plan 2019-2024, which can be found at https://www.lakeheadu.ca/faculty-and-staff/departments/services/human-rights-and-equity/edi-action-plan-2019-2024. Please feel free to discuss with me any questions or concerns you have about equity in our classroom or in the Lakehead community. If I cannot answer your questions or help you address your concerns, I encourage you to contact the Office of Human Rights and Equity at humanrights@lakeheadu.ca or visit their contact page (https://www.lakeheadu.ca/faculty-and-staff/departments/services/human-rights-and-equity/contact).

Behaviour and Conduct

- Students are expected to ensure that the classroom and laboratory learning environments are inclusive, respectful, peaceful, and safe.
- Interactions and relationships with instructors and other students (in person, online, in email, etc.) within the academic context should be professional and characterized by integrity, courtesy and mutual respect.
- Lectures should be interactive - please get engaged in the material and ask as well as answer questions!
- I fully encourage a reduction in the use of paper but if you bring your laptop to take notes, please refrain from using the internet in class (otherwise you will be banned from bringing your computer).
- Please be considerate in lectures and refrain from talking as it will disturb the learning environment.
- For your benefit and the benefit of students around you, turn your phone off to ensure it does not ring during lecture and to avoid the urge to text or you may be asked to leave the lecture hall.
- Students are expected to attend all lectures and labs.
- Recording devices of any kind are not permitted to be used in lectures.

Email Policies and Etiquette

I will try to respond to email within two working days, but this is not always possible as there are many students and only 1 professor. I may also answer your question in the next class meeting if appropriate. Questions and answers that I deem of interest to the entire class may be posted (anonymously) on Brightspace or sent via course announcements if urgent. Emails that do not meet the requirements below will not be answered:

- Use your @lakeheadu.ca or @georgiancollege.ca email address when emailing instructors and others within the university. Email from other sources may be filtered out and not reach the intended recipient.
- SUBJECT LINE - Include the course code, and a brief indication of topic.
- Lecture email example: BIOL 3250 – question regarding plasma membranes
- Lab email example: BIOL 3250 Tuesday am – missed lab 2 because of illness.
- Include your NAME and STUDENT NUMBER at the end of each email. I work with many students and this facilitates my ability to help you.
- Remember, you are in a professional environment and thus all your written correspondence, including emails, should be professional. This means full sentences, proper grammar, NO text message lingo.
- Before emailing the instructor, consider the nature of your question and whether another resource should be consulted first. For example, lab-related queries should be directed to the Lab Instructors.

Accessible Learning

The University is committed to principles of respect, inclusion, and equality of all persons. The University provides services for students with disabilities (including physical, medical, learning, and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. For access to the resources and services available at Lakehead visit: https://www.lakeheadu.ca/students/student-life/student-services/accessibility/. Students requiring accommodation are asked to register by contacting Alisia Johnston, the Accessibility and Academic Skills Advisor for the Orillia Campus, at oraccess@lakeheadu.ca. ***Students are encouraged to contact their professor to discuss accommodation needs or any way in which they can help you succeed.***

Academic and Student Code of Conduct Policies

- Academic and student policies and procedures for those enrolled in the Lakehead-Georgian programs can be found on the Lakehead-Georgian Student Portal.
- All Lakehead-Georgian programs will follow the Lakehead Regulations as list in the Lakehead University Academic Calendar (http://csdc.lakeheadu.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&loaduseredits=False).The University Regulations include but are not limited to Registration, Examinations, Reappraisals and Academic Appeals, Special Examinations, Academic Misconduct, Withdrawal, and Timely Feedback. Additional Faculty Regulations may also apply. Please review the Academic Calendar.
- The Lakehead University Student Code of Conduct - Academic Integrity (https://www.lakeheadu.ca/students/student-life/student-conduct) will apply to all Lakehead-Georgian students regardless of campus of study.
- The Lakehead University Student Code of Conduct - Appeals (https://www.lakeheadu.ca/students/student-life/student-conduct) will apply to all Lakehead-Georgian students regardless of campus of study.
- The Georgian College Student Code of Conduct (http://www.georgiancollege.ca/student-code-of-conduct/) will apply to the Lakehead-Georgian students studying at the Barrie campus. Additional campus policies of Sexual Violence Procedure and Protocol (https://www.georgiancollege.ca/about-georgian/campus-safety-services/tab/sexual-violence), Alcohol, Drugs and Tobacco

(https://www.georgiancollege.ca/about-georgian/campus-safety-services/tab/alcohol-drugs-and-tobacco), and Information Technology Acceptable Use Procedure (http://www.georgiancollege.ca/wp-content/uploads/2-117IT-acceptable-use.pdf) also apply.

- The Lakehead University Student Code of Conduct – Non-Academic (https://www.lakeheadu.ca/students/student-life/student-conduct) will apply to the Lakehead-Georgian students studying at the Orillia campus.

Plagiarism and Academic Dishonesty

A breach of Academic Integrity is a serious offence. The principle of Academic Integrity, particularly of doing one's own work, documenting properly (including use of quotation marks, appropriate paraphrasing and referencing/citation), collaborating appropriately, and avoiding misrepresentation, is a core principle in university study. Students should view the Student Code of Conduct -Academic Integrity (https://www.lakeheadu.ca/students/student-life/student-conduct) for a full description of academic offences, procedures when Academic Integrity breaches are suspected and sanctions for breaches of Academic Integrity.