

## LABORATORY BIOLOGY (BIOL 2910) Course Syllabus W2022

The ongoing global COVID-19 pandemic affects us all and brings unique challenges to post-secondary education. We are here to help you succeed and will make every effort to grant reasonable requests for accommodation. We ask that you also be flexible and recognize that the uncertain and fluid nature of the pandemic may require impromptu adjustments to the course and syllabus. You will be informed prior to any changes and you will not be penalized or have your grade negatively affected as the result of any changes. We appreciate your understanding. Together, we can do this!

### Faculty Information

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*Lab Instructor*

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### Calendar Description

*Laboratory Biology .00; 1-5.* Introduction to basic laboratory techniques: pipetting, preparation of media, aseptic technique, cell disruption, protein purification and analysis, electrophoresis, chromatography. Development of skills in such areas as: laboratory note-keeping, reporting, graphical presentation of data, information searching.

### General Description

The goal of this course is to create a meaningful and creative laboratory experience for students who are interested in exploring experimental biology, and give you the skills necessary to work or study in many other related areas, such as medicine, environmental studies, forensics or biotechnology.

- *Note that due to the current global COVID-19 pandemic labs will be offered remotely via Zoom until the end of January at which point they will switch to in-person, unless indicated otherwise.*

### Course Learning Outcomes

At the completion of this course, students will be able to:

- Work safely in the lab;
- Perform various laboratory techniques using DNA and protein;
- Work safely and efficiently in a Containment Level 2 Biological Laboratory;
- Practice aseptic techniques;
- Practice the scientific method;

- Keep a good laboratory notebook;
- Calculate concentrations, dilutions, and prepare biological solutions, buffers, and media for various protocols;
- Weigh and pipette accurately and precisely;
- Understand the importance of running quality control samples when conducting lab experiments;
- Calculate basic statistics (means, standard deviations, significance tests) on data;
- Prepare publishable figures and tables;
- Conduct literature searches and write a literature review;
- Derive research questions and form logical hypotheses;
- Cite peer reviewed literature to support or refute findings from lab experiments;
- Understand the theory and importance of pH and biological buffers;
- Extract proteins and analytes of interest from tissues using various solvents and buffers. Explain why particular reagents are included in extraction solutions;
- Explain the theory of spectrophotometry and practice its application in the study and quantification of proteins;
- Explain the theory and apply techniques commonly used to purify and identify biomolecules;
- Explain the theory of tissue culture and apply it to a eukaryotic system (e.g. plant micro-propagation);
- Refine the skill of bioscience report writing through various written and video assignments;
- Prepare a final formal report in the style of a peer reviewed bioscience journal article. Data for this report is generated over several labs;
- Develop skills to collaborate with other scientists by working in groups both to conduct the experiment and write reports;
- Witness the practice of bioscience laboratory techniques in both an applied and research setting.

### **Topics/Techniques Covered**

- Pipetting
- Weighing
- Spectrometry
- Buffer preparation
- Tissue collection and homogenization
- Centrifugation
- Chromatography (thin layer, gel permeation)
- Antibodies to detect proteins
- Electrophoresis (SDS-PAGE)
- Western blot (dot blots)
- PCR
- Biomacromolecule purification, identification and characterization

### 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](mailto:mycourselink@lakeheadu.ca).

### Textbook

The lab manual will be provided as required on the course D2L page.

### Class Schedule

Lab 1 (Dr. Menon)	Tuesdays	11:30am-2:30pm	Zoom/In-person (OA3002)
Lab 2 (Dr. C-A.)	Thursdays	2:00-4:00pm	Zoom/In-person (OA3002)
Tutorial (Dr. C-A.)	Tuesdays	2:30-3:30pm	Zoom

No classes on: Monday, Feb. 21 to Friday, Feb. 25, 2022 (Study Week)  
Saturday, April 9 to Sunday, April 10, 2022 (Exam Preparation Days)  
Friday, April 15 and Monday, April 18, 2022 (Good Friday and Easter Monday)

Exam Period runs Monday April 11, 2022 to Sunday, April 24, 2022 (Includes two weekends) with Monday, April 25, 2022 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 remotely in a synchronous format until the end of January. Assuming it becomes possible to return to campus, Labs 1 and 2 will be offered in-person while the tutorial will remain online. **The class will meet Tuesdays and Thursdays, unless otherwise indicated.**
- Independent work, including readings, assignments, and lab reports, will be assigned to be completed at your leisure.
- A **course schedule** will be provided separately including lab report due dates.

### **Laboratories**

Laboratory sessions are designed to introduce you to some of the common laboratory techniques of animal physiology and give you some hands-on experience with some of the basic concepts covered in lectures. **This year all the labs have been adapted to be offered online.** There will be 10 synchronous lab sessions that you must attend, each with a pre-lab quiz and lab assignment or report. The lab instructor will demonstrate the techniques and experiments and guide you through each lab. There will be 2 additional asynchronous labs that you will complete on your own.

**It is mandatory to attend all synchronous laboratory sessions.** If you miss a laboratory session you will receive 0% on the report and/or on the assignment that week. There is only one lab session and therefore there are no opportunities for make up lab classes. Exceptions to this policy will only be granted in cases of verifiable medical emergency related to you, or a personal reason, disclosed to and accepted by the instructor. In the case of an allowable absence, the instructor may decide to apply the missing grade(s) to the final, with an appropriate scoring percentage adjustment. **If you miss a lab it is your responsibility to contact the lab instructor.**

- *Note that due to the current global COVID-19 pandemic labs will be offered remotely via Zoom until the end of January at which point they will switch to in-person, unless indicated otherwise.*

**Lab supplies:** The lab manual will be supplied in pdf format via the course Brightspace.

- *Labs start the week of Jan. 17, 2022.*

### Grading Scheme and Dates

Component	Value
<b>Experimental Reports</b> (3 x 15% each)	= 45%
<b>Technical Reports</b> (3 x 5% each)	= 15%
<b>Pre-lab Quizzes</b> (6 x 2.5% each)	= 15%
<b>Lab Participation</b>	= 5%
<b>Final Theory Test</b> (March 31, 2022)	= 20%
<b>Total</b>	= 100%

### Exam and Assignment Policies

**Term Test Policies:** 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

### **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](mailto: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](mailto: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&loaduserredits=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) (<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.

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