BIOL368 Genetics and Cell Biology Laboratory Winter 2022

Lecture location:	CC-310 (new)
Lecture time:	Fri 10 :15 -11:30
Lab location:	SP-385.09
Lab times:	Sections 01 (Tue), 02 (Wed) and 03 (Thu): 13:30 – 17:30

Instructor: Dr. Madoka Gray-Mitsumune
Room: SP-375.15, Tel: 848-2424 ext. 4026
Email: Madoka.Gray-Mitsumune@concordia.ca **Please put BIOL368 in the subject line!**

If you have quick questions, you can ask them after the lecture on Friday or after finishing your lab work. Otherwise, please use the appointment booking system on Moodle.

Technician: Robert Carson
Room: SP-375.29, Tel. 848-2424 ext. 3418, E-mail: Robert.Carson@concordia.ca

Teaching Assistants: Please obtain TA information from Moodle.

Course Description

This course introduces students to the basic laboratory techniques of cell biology, microbiology, bacterial genetics, and molecular biology. Experiments include: cell membrane functions in red blood cells, bacterial identification, mutagenesis, genetic transformation, gene mapping, DNA isolation and recombinant DNA techniques. Through tutorials, students learn the theory behind techniques and their use in research. Special focus is placed on lab manipulation skills, data organization, and data interpretation.

Lab manual

Please download the lab manual from the Moodle BIOL368 course portal.

Other course materials

Lab book (bound hardcover, not spiral bound), calculator, lab coat, and safety glasses.

Computer skills

You should be able to use MS Word and Excel (or equivalent software). If you are not familiar with spreadsheet calculations, graph creations, etc., self-tutorials are found here (links to Microsoft Office tutorial page).

Additional resources

No textbooks are assigned. Please check Moodle for suggested readings & relevant resources.

Marking Scheme

Item	% of final grade
Lab reports	31 %
Lab skill test	5 %
Online Quizzes	2 %
Online lectures & video demonstration & class participation	8 %
Midterm (Feb 25)	10 %
Final exam (cumulative)	40 %
Prelab mini-quiz	2 %
Prelab assignment	2 %
Performance penalty	- 1 % per incident
Performance bonus	Up to 2 % per term

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

Lab projects

Project (short title)	Report due	% of final grade
5. Microscopy	Online lab Jan 18, 19, 20	3 %
1. Spectrophotometer	Feb 1, 2, 3	1.5 %
	(Resubmission) Feb 15, 16, 17	1.5 %
2. Aseptic techniques	Feb 22, 23, 24	4 %
3. Bacterial Genetics	Mar 8, 9, 10	5 %
6. DNA extraction	First half: Mar 15, 16, 17 Complete report: Mar 22, 23, 24	6 %
7. Cloning	Part I: Mar 29, 30, 31 Part II: Apr 5, 6, 7	6 %
8. Physiology	Apr 12, 13, 14	4 %

*No formal report for project 5. Students perform online lab on Moodle during the lab period.

Lab Report submission

A large part of your mark comes from your lab reports. Follow specifications (BIOL368 Lab Report Guideline, BIOL 368 Lab manual & Project-specific grading scheme). Lab reports are submitted online and graded online. The lab report file must contain all sample calculations. If drawings/pictures are required, scan the drawing and add it to the report file.

Late penalty (5 % per day) will be calculated based on the date of uploading, including weekends. The submission link remains open for one week after the due date. If you have not submitted your report by then, you receive a grade of zero.

A late penalty will be handled by the instructor, not by TA. If you are experiencing unexpected difficulties (health problems, stressful events, etc.), please contact the instructor as soon as possible. We'll try to figure out a suitable solution. However, it is not possible to make alternative arrangements for multiple assignments.

Lab skill test

You will perform routine lab procedures (aseptic techniques, dilutions, pipetting, spectrophotometer, etc.) within a time limit. Evaluation is based on your behaviour in the lab as well as the outcome of the procedure.

Performance penalties

Your TA will monitor your lab performance and report any improper behaviour in the lab. This will count as a penalty, and 1 point per incident will be subtracted from your final grade. Penalty points may be taken for:

- Pre-lab not done before coming to the class
- Late for the lab
- Violation of safety protocols
- Improper usage of equipment
- Mistakes in lab procedures due to carelessness
- Not completing lab procedures before leaving
- Not cleaning up after the lab
- Not submitting data for class data collection
- Any other improper behaviours

Performance bonus

Students who showed exceptional lab performances throughout the term will be awarded up to two bonus points per term.

Lab Attendance

Lab attendance is mandatory. Alternative arrangements are made only for exceptional circumstances. If you cannot come to the lab due to illness or any other serious reasons, call me at 514-848-2424 ext 4026 or e-mail me. Each situation is assessed on a case-by-case basis. Please note make-up labs are not always possible because (1) we handle living organisms, and (2) we need to respect the working hours of the technician and TAs. If you miss multiple essential labs, you will receive a grade of F.

Do you suspect COVID-19? Contact me even if you already filled out the COVID-19 self-isolation form. EHS is not going to request academic accommodation on your behalf.

Lab book

A bound laboratory notebook must be used to record pre-lab activities (see below), any changes made to the procedures, results, and analyses of the results. The date and project number should be clearly written when you make entries to your lab book. Tape any loose papers (class results, charts and graphs, etc.) into your lab book. Guard your lab book. Your lab book needn't be beautiful but should be legible to you and anybody else. Good lab book-keeping is the key to successful research activities.

Before the lab

Reading:

Read the lab manual on your own time before the allocated lab period. Read it at least twice. First, to get an overview of what you'll be doing for the particular project. The lab manual is organized by that week's work but not by the project. Many projects are spread over two or three weeks. You will not understand the project until you read through all the experiments needed to be done. Review background materials as needed.

Once you understand the project, then read through again step-by-step what you will be doing during the particular week and plan how to carry out the work by drawing flowcharts, diagrams or schemes. Standard calculations must be done beforehand. You'll enter these works as pre-lab in your lab book (see below).

Pre-lab:
You must prepare a pre-lab in your lab book before coming to the lab. The pre-lab should include a flowchart, diagram or scheme of what you will be doing in that day's lab as well as any tables, calculations and other information needed (plasmid maps, strain descriptions, etc.). Complete the pre-lab assignments designated by the lab manual. **Pre-labs must be signed by your TA** at the beginning of the lab. **Then they are graded during the lab**. Please do not attach a pre-lab to your lab report.

Pre-lab quiz: A short quiz will be administered at the beginning of the lab. The questions are based on the lab procedures for the day and the background knowledge needed to perform the procedures.

During the lab

- Wear a lab coat. Wear safety glasses if needed. Long hair must be tied up.
- No food/drink. No bags. No cell phones. No open-toe sandals. No baseball hat.
- Wash hands before and after the lab. Wear gloves if needed.
- Wipe the benchtop before and after the lab.
- Check the whiteboard for extra information. Modification to the procedures will be written on the whiteboard. Copy any changes to the procedures into your lab book. You'll need to include this information in the lab reports.
- You will work in pairs. Make sure that both of you learn your lab manipulation skill during the lab period. There will be a lab skill test at the end of the term.
- Ask for assistance if you make a mistake during your experiment. Within limits, we can supply fresh materials to repeat the experiment. Alternatively, we can suggest ways to correct your mistake.
- If lab activities involve calculations, check for the accuracies by consulting TAs or other students.
- The lab manual lists a number of questions you need to answer when you analyze your results. Deal with the questions during the lab period. Discuss with your partner and fellow students. Ask TAs for help. Answers to these questions should be included in the lab reports.
- Enter all your data into your lab book. Pictures do not substitute lab book entries.

At the end of the lab

- CLEAN UP the lab bench.
- Submit the student data entry form to your TA.
- Check with your TA before leaving. TA will check your bench space and data entry in the lab book.

Section and class data:

Section data: When section or class data are required, your group data will be entered into an Excel spreadsheet by your TA. The file will be uploaded to Moodle. You need to download the file from Moodle.

BIOL 368 Class meeting schedule (Fri) 10:15-11:30

	Topic
Jan 7	No meeting
Jan 14	Course structure & lab procedures
Jan 21	Microscopy Review
Jan 28	Lab report structures
Feb 4	Aseptic techniques Review
Feb 11	Bacterial Genetics Review
Fab 18	Mutagenesis Review, midterm exam info
Feb 25	**Midterm exam**
Mar 11	DNA extraction review
Mar 18	No meeting
Mar 25	Cloning review, skill test info
Apr 1	No meeting
Apr 8	Physiology review, final exam info

Online lecture schedule

Due	Topic
Jan 9	Safety regulation & general lab protocols
Jan 16	Microscopy
Jan 23	Aseptic Techniques
Jan 30	Bacterial Genetics
Feb 6	Mutagenesis I
Feb 13	Mutagenesis II
Mar 6	DNA extraction
Mar 13	Cloning I
Mar 20	Cloning II
Mar 27	Physiology
Apr 3	Horizontal Gene Transfer

* Submit H5P video quizzes before the due date to get participation scores.

Lab schedule is on the last page.

Important notes on academic misconduct

Plagiarism is the most common act of academic misconduct. Plagiarism can be defined as handing in a work that is not your own. This includes copying materials from published or unpublished sources without citing the source, or copying from another student's work.

All lab reports will be scanned by plagiarism software at the end of the term. If suspicious activities are detected, the instructor must a file incident report to the Code Administrator and the sanction will be determined by the Code Administrator. The procedure is in place to identify students who repeat misconducts. Students may not be notified individually by the instructor or TA until the incident report is submitted. Since scanning is done at the end of the term, you may receive notification only at the end of the term. In that case, you will temporally receive a grade of NR. NR grade will be changed to appropriate grade later on.

If Student A provides her/his assignment to Student B and Student B ends up copying the assignment, both Student A and B are guilty of misconduct. Please safeguard your assignments and assignment files. It is in your best interest. Lab partners may have the same results to work with. However, each report must be written in the individual's own words.

The following statements are taken from The Academic Integrity Website (http://www.concordia.ca/students/academic-integrity/plagiarism.html).

*"**Plagiarism**:*

*The most common offense under the Academic Code of Conduct is plagiarism which the Code defines as **"the presentation of the work of another person as one's own or without proper acknowledgment."***

This could be material copied word for word from books, journals, internet sites, professor's course notes, etc. It could be material that is paraphrased but closely resembles the original source. It could be the work of a fellow student, for example, an answer on a quiz, data for a lab report, a paper or assignment completed by another student. It might be a paper purchased through one of the many available sources. Plagiarism does not refer to words alone - it can also refer to copying images, graphs, tables, and ideas. "Presentation" is not limited to written work. It also includes oral presentations, computer assignments, and artistic works. Finally, if you translate the work of another person into French or English and do not cite the source, this is also plagiarism.

In Simple Words:
DO NOT COPY, PARAPHRASE OR TRANSLATE ANYTHING FROM ANYWHERE WITHOUT SAYING FROM WHERE YOU OBTAINED IT!"

If you are not sure how to paraphrase without plagiarizing, please refer to this example given by the Academic Integrity information: http://www.concordia.ca/students/academic-integrity/plagiarism.html . Examples are shown near the end of the web page.

Winter 2022 Lab Schedule (Full capacity plan)

Lab manual	Week of	Project 1 Spectrophotometer	Project 2 Aseptic techniques	Project 3 *E. coli* genetics	Project 4 Mutagenesis	Project 5 Microscope	Project 6 DNA isolation	Project 7 Cloning	Project 8 Cell physiology	Skill test
Safety	**Jan 10**	Safety Regulation (online)								
Week 6	**Jan 17**					Online lab				
Week 1	**Jan 24**	Pipetting Spectrophotometer	Agar pouring practice							
Week 2	**Jan 31**	**Report due**	Aseptic techniques, cell count, ubiquity							
Week 3	**Feb 7**		Analysis of results Practice more if necessary	Make media for P3	Complete lectures & quiz online					
Week 4	**Feb 14**	**Re-submission due**		ß-gal assay mutant phenotypes						
Week 5	**Feb 21**		**Report due**	Analysis of results Phenotype Phage count				Make media for P7		Media for skill test
Week 7	**Mar 7**			**Report due**			DNA isolation DNA quantitation			
Week 8	**Mar 14**						**First half due**	Competent cells Ligation transformation		
Week 9	**Mar 21**						**Complete lab due**	Restriction enzyme analysis Agarose gel electrophoresis		
Skill test	**Mar 28**							**First half due**		**Skill test**
Week 10	**Apr 4**							**Complete lab due**	Cell Physiology	
	Apr 11								**Report due**	

Green highlight: in-person lab; Pink highlight: online lab