

**LAND ACKNOWLEDGEMENT**

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəyəm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

COURSE INFORMATION

Course Title	Course Code Number	Credit Value
Biochemistry Laboratory	BIOC 301	3

PREREQUISITES

Third year standing in BIOC, CAPS or PHAR

COREQUISITES

Bio 302 (Term 1 or 2) or BIOC 303

COURSE LOCATION AND TIME

Time (Day(s), Hour)	Room
Lecture: Tuesday 12:30-1:30pm	Henning 200 (Term 1) Friedman 153 (Term 2)
Lab: One of Tuesday, Wednesday, Thursday or Friday 2-5pm	BioSciences 3014

COURSE CHAIR/INSTRUCTOR

Course Chair	Contact Details	Office Location	Office Hours
Jason Read (he/him/his)	Jason.Read@ubc.ca	BioSCi 3012	Monday 2-3pm (Zoom) or By appointment



LEARNING OUTCOMES

In Bioc 301 we will be seeking to develop:

- A knowledge and understanding of several biochemical techniques, some of their limitations and how they may be applied to biochemical problems.
- Good experimental organization and the ability to recognize what are the more important practical considerations in experimental procedures, particularly the use of proper controls.
- The ability to critically analyze experimental data and produce meaningful results from experimental work.
- The ability to prepare well written, meaningful scientific reports and presentations.

COURSE OUTLINE

This lab course consists of ~20 weeks of three hour lab blocks and accompanying lectures. The lab blocks will encompass experiments, demonstrations and analysis which are intended to illustrate some basic biochemical concepts and to familiarize you with some of the techniques, protocols and analysis used in modern experimental molecular biology.

Assessment will primarily be based around the production of lab reports, presentations and a mid-course and final exam.

In person lectures and labs will be supported by the use of Canvas, Piazza, Zoom, Panopto and Turnitin.

**COURSE SCHEDULE**

The schedule of experiments and lecture topics will be indicated in the Course Schedule document which is available on the course Canvas page. A general outline can be found here but some dates may change given the outcome of our experiments:

Bioc 301 Calendar Term 1		
Week of	Modules	Learning objectives/Aims
Sept 13 th	Module 1 - Introduction	<ul style="list-style-type: none"> Introduce the course and the goals.
	Module 3* – DNA Barcoding (week 1)	<ul style="list-style-type: none"> Collect, plate and grow bacteria
Sept 20 th	Module 2 - PCR basics by Dr. Stephanie Cheung	<ul style="list-style-type: none"> Understand the basic components of PCR (template, primers, buffer, polymerase)
	Module 3 - DNA barcoding (week 2)	<ul style="list-style-type: none"> Continue Module 3
Sept 27 th	Module 6* – Presentations (week 1)	<ul style="list-style-type: none"> Pick a research article to present with your partner
Oct 4 th	Module 3 - DNA barcoding (week 3)	<ul style="list-style-type: none"> Practical applications of PCR
Oct 11 th	Module 3 - DNA barcoding (week 4)	<ul style="list-style-type: none"> Use agarose gel electrophoresis to determine if our PCRs were successful.
Oct 18 th	Module 3 - DNA barcoding (week 5)	<ul style="list-style-type: none"> Identify the isolated bacterial species
	Module 4 - Cloning basics by Ms. Cindy Lam	<ul style="list-style-type: none"> understand the basic principles of molecular cloning (restriction digest, ligation, transformation) including the need for proper controls
Oct 25 th	Module 5 - Gene cloning (week 1)	<ul style="list-style-type: none"> Design primers and PCR cycling for the amplification of an <i>E. coli</i> gene by PCR.
Nov 1 st	Module 5 - Gene cloning (week 2)	<ul style="list-style-type: none"> Generating competent BL21 <i>E. coli</i> cells
Nov 8 th	Mid-term break	
Nov 15 th	Module 5 - Gene cloning (week 3)	<ul style="list-style-type: none"> Begin practical cloning DNA barcoding lab due
Nov 22 nd	Module 6 – Presentations (week 2)	<ul style="list-style-type: none"> Present a research article TA lectures
Nov 29 th	Module 6 – Presentations (week 3)	<ul style="list-style-type: none"> Present a research article TA lectures
Dec 11 th - 22 nd	Exam period	



Bioc 301 Calendar Term 2		
Week of	Module	Learning objectives/Aims
Jan 10 th	Module 7 – Tissue culture (week 1) by Mr. Reid Warsaba	<ul style="list-style-type: none"> Understand every step needed to properly count, seed and passage cells
Jan 17 th	Module 7 – Tissue culture (week 2) by Mr. Reid Warsaba	<ul style="list-style-type: none"> Know how to properly and safely work in biological safety cabinet, using proper aseptic technique
Jan 24 th	Module 5 - Gene cloning (week 4)	<ul style="list-style-type: none"> Setting up restriction digests of PCRs and pET32a-HA plasmid.
Jan 31 st	Module 5 - Gene cloning (week 5)	<ul style="list-style-type: none"> Ligation of restriction endonuclease digested genes into the pET32a-HA plasmid.
Feb 7 th	Module 5 - Gene cloning (week 6)	<ul style="list-style-type: none"> Counting and picking successful ligation transformations
Feb 14 th	TBD	
Feb 20 th - 24 th	Reading Week	
Feb 28 th	Module 5 - Gene cloning (week 7)	<ul style="list-style-type: none"> Checking isolated cloned plasmids by DNA spectrophotometry and by DNA sequencing.
Mar 7 th	Module 8 – Recombinant protein (week 1)	<ul style="list-style-type: none"> <i>Analysis of NAPS Sanger sequencing data</i>
Mar 14 th	Module 8 – Recombinant protein (week 2)	<ul style="list-style-type: none"> Induction and isolation of recombinant proteins <i>Cloning lab report due this week</i>
Mar 21 st	Module 8 – Recombinant protein (week 3)	<ul style="list-style-type: none"> SDS-PAGE
Mar 28 th	Module 8 – Recombinant protein (week 4)	<ul style="list-style-type: none"> Western Blot
Apr 4 th	Pre-exam	<ul style="list-style-type: none"> Exam structure, expectations, office hours <i>Recombinant protein lab report due this week</i>
Apr 17 th - 28 th	Exam period	



COURSE MATERIALS

Course materials will be available through Canvas. They will consist of the Course Schedule, Protocol Documents and the course handbook. There is no textbook required for this course.

GRADING SCHEME

Assignment	Grade Weight
Lab performance	10% (5% each term)
Lab Reports	45% (15% each)
Online modules	5% (total for 3 modules)
Presentation	10%
Mid-course Exam/assignment	10%
Final Exam/assignment	20%

GRADING AND COURSE POLICY

Students are expected to attend their lab at the scheduled time and complete a satisfactory proportion of the lab work; if you cannot attend a lab for some reason you must let your TA and your lab partner know as far ahead of time as possible.

Students are also expected to prepare, and hand-in lab reports and other assessments. For written work there will be a mark penalty assessed to late reports if extensions are not previously arranged; 10% per day for a maximum of 5 days.

Students with disabilities and ongoing medical conditions have the option to request an accommodation for the course assessments after registering with the Centre for Accessibility. If you are eligible for exam accommodations, you will need to write your exams with the Centre for Accessibility. To book an exam, notify the course chair or instructor by email and register with the Centre for Accessibility at least one week in advance of the midterm date or summer final, or at least 7 days before the start of the examination period for a final in April and December.

If you are ill, please do not attend class. If you do miss class/assessments because of illness you must let your TA and your lab partner know as far ahead of time as possible.

If you do miss a final exam because of illness: Students who miss a final exam due to illness or extreme personal distress and would like to apply for a deferred exam must submit a request for an academic concession within 48 hours of the missed exam. All appropriate documentation must be submitted within 14 calendar



days of the missed exam. In addition the course chair and instructor should also be notified by email within 48 hours to coordinate the deferred exam.

If the instructor is sick: We will all do our best to stay well, but if one of the instructors falls ill then they will not come to class. If that happens, all efforts will be made to communicate that to students in a timely manner prior to class time, usually via an announcement in Canvas. Depending on the situation a substitute lecturer will take over, the lecture may take place over zoom, or the class may be cancelled.

ACADEMIC MISCONDUCT

UBC and the Department of Biochemistry and Molecular Biology take the issue of academic misconduct very seriously; the honest assessment of student learning is key to both the success of the university and success for individual students. Cheating, in any form, undermines the value of a degree and can have serious consequences for your continued academic success. As such it is important to know what your responsibilities are, what constitutes misconduct and how you can avoid it. With some effort and forethought no student should ever have to find themselves facing discipline for academic misconduct; inform yourself as to the expectations placed on you and what your responsibilities are. UBC definition of academic misconduct can be found in the [UBC Calendar](#) and additional information is available in this [UBC resource link](#).

What consequences can arise from academic misconduct?

The severity of the discipline can range from a letter of reprimand or a zero on the assignment in question all the way to expulsion from the University. Perhaps the most common outcome in these cases are grades of zero in the course in which the misconduct occurred.

EQUITY DIVERSITY AND INCLUSION (EDI) POLICIES

It is our goal that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and diversity that the students bring to this class be viewed as a resource, strength and benefit. We make a commitment to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture. We will foster a climate within the classroom where students of diverse backgrounds and identities feel comfortable sharing their opinions and experience with varied topics throughout the class. We (like many people) are learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable or if you observe a situation where someone else is made to feel uncomfortable, please talk to us about it. This includes concerns about any class-related interactions that lead to feelings of exclusion or marginalization. We welcome and encourage your feedback on how we can better cultivate a sense of inclusion in our course. This can be done through meetings, email or anonymous feedback through canvas. We aim to do our best to address each situation as it



arises and effect meaningful changes moving forward. For more information visit our [departmental EDI webpage](#).

STUDENT RESOURCES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the [UBC Senate website](#).

Mental Health Resources

In case you are struggling with mental health, or are feeling stressed or anxious, [UBC Counselling services](#) provides information about a number of resources for students to use. Additionally, UBC students receive [mental health coverage of up to \\$1500](#) under the AMS Health & Dental Plan (more information about coverage [here](#)).

[Here2Talk](#) is available for BC post-secondary students to talk with trained counsellors 24/7 (via voice call or text messages). If you are a student living in UBC residence, [Counsellors in Residence](#) can also be a valuable resource to provide mental health support. If you have a UBC email address, [Therapy Assistance Online \(TAO\)](#) is a free online resource that provides tools to manage stress, relationship problems, substance use, etc.

COVID RELATED POLICIES

For UBC's latest response to COVID-19, please visit [covid19.ubc.ca](#). For our in-person meetings in this class, it is important that all of us feel as comfortable as possible engaging in class activities while sharing an indoor space. Non-medical masks that cover our noses and mouths are a primary tool to make it harder for COVID-19 to find a new host. The higher the rate of vaccination is in our community overall, the lower the chance of spreading this virus. You are an important part of the UBC community. Please arrange to get vaccinated if you have not already done so. **If you're sick, it's important that you stay home - no matter what you think you may be sick with (e.g., cold, flu, other).**

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