

General Course Information

BIOL 212: Scientific Methods in Biology (Fall 2026)

Course Description: A hands on laboratory course that establishes the fundamentals of scientific investigation and applies them to selected biological questions. Students will learn to develop hypotheses, design and execute experiments, and to analyze and present results. There will be four main modules structured as: Cell, Organism, Population, and Ecosystem.

Units: 3.0

Course Components: Lecture, Laboratory, Field Studies

Mode of Instruction: In-Person

Lecture/Lab Times and Locations: See Solus

Course Email: biol212@queensu.ca

Important University Dates

Key dates (first day of class, tuition due date, last day to add/drop courses) are important to your academic success. Please find them at Important Dates.

If you enroll in the course late, please email biol212@queensu.ca immediately.

Welcome Message

Welcome to Scientific Methods in Biology! This hands-on course will teach you the fundamentals of scientific investigation and let you apply them to pressing biological questions. You will learn to develop hypotheses, design and conduct experiments, and analyze and present results.

The course design is based on active learning, which means it emphasizes learning through *doing*. There is much research to show that active learning fosters higher quality learning, but more importantly it makes for a much more exciting course! For more about active learning, see: <https://www.queensu.ca/ctl/resources/instructional-strategies/active-learning>

We look forward to seeing you in the lectures and labs!

Equity, Diversity, and Inclusivity Statement

Queen's University recognizes that the values of equity and diversity are vital to and in harmony with its educational mission and standards of excellence. It acknowledges that direct, indirect, and systemic discrimination exists within our institutional structures, policies and practices and in our community. These take many forms and work to differentially advantage and disadvantage persons across social identities such as race, ethnicity, disability, gender identity, sexual orientation, faith, and socioeconomic status, among other examples.

Land Acknowledgement

Queen's University is situated on traditional Anishinaabe and Haudenosaunee Territory. To acknowledge this traditional territory is to recognize its longer history, one predating the establishment of the earliest European colonies. It is also to acknowledge this territory's significance for the Indigenous peoples who lived, and continue to live, upon it – people whose practices and spiritualities were tied to the land and continue to develop in relationship to the territory and its other inhabitants today. The Kingston Indigenous community continues to reflect the area's Anishinaabe and Haudenosaunee roots. There is also a significant Métis community and there are First Peoples from other Nations across Turtle Island present here today.

We encourage you to learn about the history of these lands.

<https://www.queensu.ca/encyclopedia/t/traditional-territories>

<https://www.queensu.ca/indigenous/ways-knowing/land-acknowledgement>

Ways of Knowing

This course is called “Scientific Methods in Biology”, but a more appropriate name might be “Western Scientific Methods in Biology”. We recognize that the Western way is just one way of knowing and other ways are equally valuable. Indigenous Peoples have been accumulating scientific knowledge on these lands for thousands of years, following traditional holistic methods.

While we teach the Scientific Method from a Western perspective, we acknowledge that this approach is not without its biases. We emphasize objectivity but know that we cannot ignore how different values, backgrounds and experiences influence us all. We strive to do our best.

Expectations

As your instructors, we will

- do our best to help you both enjoy and succeed in this course
- offer many different opportunities for you to demonstrate your abilities
- give constructive and timely feedback
- provide support and encouragement
- communicate with you respectfully

From you, as students, we expect

- your attendance and attention at lectures
- your on-time attendance and participation in your scheduled lab sessions (assigned in Solus)
 - lab sessions will begin on time and everyone should be seated and ready to go at this time
 - you will be permitted one late arrival (up to 30 minutes) without penalty; beyond that, if you arrive to the lab after the TA has recorded absences/late arrivals on the sign-in sheet, you will lose the attendance portion of the lab notebook grade for that day
 - you will know you have been recorded as arriving late if there is a circle around your seat on the sign-in sheet
 - ensure you are always at your usual seat at the beginning of the lab so the TA can see that you are present

- you to come to the lab with your lab coat (all "wet" labs = Labs 1-3 for each module, Lab Skills lab, Lab Practical) and wearing closed-toe and closed-heel shoes (all labs)
 - anyone not wearing proper lab attire will be asked to leave, and will be deducted marks for the lab notebook and lab report accordingly
 - that you show proper care for lab materials and follow all clean-up instructions
 - deductions will be applied to lab report grades for groups that don't clean up
 - on-time submission of activities
 - see "Submitting Properly and On-Time", below
 - that you will uphold the values of academic integrity
 - see the "Academic Integrity" section later in this Syllabus
 - respectful communication and interactions with peers and members of the teaching team
 - see the "Netiquette and Discussion Statement", below
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Submitting Assessments Properly and On-Time

Only assignments received by the due date will be accepted. All other submissions will receive a grade of zero. To avoid this:

- Don't wait until the last minute, as technical delays may prevent your submission from going through. Submissions received even 1 minute past the deadline cannot be accepted.
 - Make sure you submit the proper file, in the proper format. If you've submitted the wrong file, or a file in a format that cannot be read (including corrupted files), the submission will receive a grade of zero.
 - Make sure you submit your file to the proper folder. Submissions submitted on time but to the wrong folder will receive a 10% penalty.
 - For group submissions, note that it is the responsibility of all group members to ensure proper, on-time submission. Be sure to double-check that your designated group member has submitted your assignment properly.
 - Adhere to all dates as indicated in the Timeline only. Automated onQ notifications about activity deadlines may not be accurate, as onQ is not able to tailor these notifications to different lab sections running on different days.
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Netiquette and Discussion Statement

University is a place to share, question, and challenge ideas. Each student brings a different set of lived experiences. You can help to create a safe, respectful place for each other by promoting the following guidelines:

1. Make a personal commitment to learn about, understand, and support your peers.
2. Assume the best of others and expect the best of them.
3. Acknowledge the impact of oppression on other people's lives and make sure your communications are respectful and inclusive.
4. Recognize and value the experiences, abilities, and knowledge each person brings.

5. Pay close attention to what your peers say/write before you respond. Think through your response carefully before you say/send it to others.
6. It's alright to disagree with ideas, but do not make personal attacks.
7. Be open to being challenged or confronted on your ideas, and challenge others with the intent of facilitating growth. Do not demean or embarrass others.
8. Encourage others to develop and share their ideas.

Course Learning Outcomes

Upon successful completion of this course, you should be able to:

1. **Apply the scientific method** to biological problems by developing hypotheses with testable predictions, determining appropriate treatments/controls, designing unbiased sampling protocols, testing predictions in a statistical context, evaluating hypotheses based on results, and identifying the scope of inference.

Associated assessments:

- Lab Notebooks
- Lab Reports

2. **Write all phases of a scientific article** including an Introduction that integrates primary literature with the experimental question, Methods, Results, and a Discussion that situates your conclusions in the existing primary literature.

Associated assessments:

- Lab Reports
- AI Skills Mini-module

3. **Show proficiency in practical research skills**, such as maintaining a research notebook, pipetting, working with volumes, general numeracy skills, accurate use of a balance, aseptic technique, and cell culture.

Associated assessments:

- Lab Notebooks
- Skills Mini-modules (lab, field)
- Lab Practical

4. **Identify how biological systems respond to their environment** at the hierarchical levels of cells, organisms, populations, and ecosystems.

Associated assessments:

- In-Lecture Quizzes
- Lab Reports

5. **Identify and distinguish the mechanisms that allow biological systems to respond** over short versus long time periods (cellular, physiological, demographic, evolution, community composition).

Associated assessments:

- In-Lecture Quizzes
- Lab Reports

United Nations Sustainable Development Goals (SDGs)

BIOL212 addresses the following SDGs (<https://www.undp.org/sustainable-development-goals>):

- Goal 12: Responsible Consumption and Production
 - Emphasis on sustainable laboratory practices
- Goal 15: Life on Land
 - Investigations into the salinization of plants and freshwater systems

Course Materials

Textbook

There is no textbook required for this course.

Lab notebook

You'll need to have a notebook that you can bring with you to the lab and leave in the lab room all term. You can purchase a hard-cover bound notebook if you'd like, but we recommend just going with an inexpensive (e.g. dollar store) soft-cover spiral notebook, or repurposing a partially used notebook.

Lab safety

You will need to bring your own **lab coat**, wear closed-toe and closed-heel shoes, and have long hair tied back when working in the lab (applies to all "wet labs", which are the majority of the labs). Lockers will be provided to store your belonging during lab, however, they must be emptied following your lab session.

Field trip

There is a mandatory field trip in this course that costs ~\$75. No specialized equipment is required, however be sure to dress appropriately and seasonally for outdoor work (e.g. sturdy footwear, rain jacket). Payment for this trip is required to receive a grade for the field skills activity.

Internet-Connected Device

An internet-connected device is required to access all lectures and labs. Lecture quizzes will be completed in onQ during lecture period and must be accessed using Queen's wifi.

Suggested Time Commitment

In this course, you should expect to invest, on average, close to 10 hours per week. As this is a fast-paced, active course, it's imperative that you set aside enough time each week to keep on top of the material.

The table below provides an estimate of hours of study. Keep in mind that time commitment will vary among students depending upon individual aptitude, level of background, etc.

Activity	Average Hours/Week	Number of Weeks	Total
Online activities	2	6	12

Scheduled lectures	1	10	10
Scheduled labs	6	10	60
Field trip	7	1	7
Private study	2	12	24
Total			113

Timing of Final Examination

There is no final exam for this course; however, there is a hands-on Lab Practical in Week 12 to assess your progress in various lab skills development throughout the term. The Practical runs during your regularly scheduled lab period.

Assessment

Breakdown of Assessment Grades

Component	Due Date	Weighting (%)	Learning Outcome Assessed
<u>In-Lecture Quizzes</u>	.	[16 total]	#4, #5
Cell 1+2	Sep 14	2	
Cell 3+4	Sep 21	2	
Org 1+2	Oct 5	2	
Org 3+4	Oct 19	2	
Pop 1+2	Oct 26	2	
Pop 3+4	Nov 2	2	
Eco 1+2	Nov 16	2	
Eco 3+4	Nov 23	2	
Guest Lecture	Nov 9	2	#4, #5

<u>Lab Notebooks</u>	.	[16 total]	
Cell	Sep 24/25	4	#1, #3
Org	Oct 22/23	4	
Pop	Nov 10/11	4	
Eco	Nov 26/27	4	
<u>Lab Reports</u>	.	[40 total]	
Cell	.	10	#1, #2, #4, #5
Part A	Sep 17/18	.	
Part B	Sep 24/25	.	
Part C	Sep 28	.	
Organism	.	9	
Part A	Oct 8/9	.	
Part B	Oct 22/23	.	
Population	.	9	
Part A	Nov 3/4	.	
Part B	Nov 10/11	.	
Ecosystem	.	12	
Part A	Nov 19/20	.	
Part B	Nov 26/27	.	
Part C	Dec 7	.	
<u>Skills Mini-Modules</u>	.	[16 total]	
Lab Skills Prep Quiz	Sep 9	2	#2, #3
Lab Skills Activity	Sep 10/11	2	
Field Skills Prep Quiz	Sep 18	2	
Field Skills Activity	Sep 25	2	
AI Skills Lecture Activity	Sep 28	2	
AI Skills Activity	Oct 1/2	6	
Lab Practical	Dec 1/2	10	#3

More details can be found in the Timeline.

Description of Assessments

In-Lecture Quizzes

The online and lecture components provide the biological background needed to understand the research question(s) motivating each module.

You will work through the online lessons prior to lecture. The lectures review online material, allow for discussion of challenging concepts, and connect the biological concepts with the laboratory activities.

- You will be quizzed during these lectures to assess your understanding of the online material and material covered during the lecture.
- Quiz answers must be submitted individually in onQ, but you will be encouraged to discuss the questions with your classmates first.
- **You must attend the lectures to participate in these quizzes.** Only quizzes submitted over Queen's wifi will be accepted (restricted to IP ranges from 130.15.0.0 to 130.15.255.255). **If you are unable to connect to Queen's wifi during a lecture, notify the instructor immediately (before the quiz begins).**

Guest Lecture

There will be one guest lecture, accompanied by a small assessment. The assessment will be conducted via an onQ quiz during the lecture (i.e. similar to the in-lecture quizzes described above). The quiz will be based on material covered by the guest speaker(s) so no preparation is required.

Lab Notebooks

Complete, properly-maintained lab notebooks are critically important physical documents in all research labs. You will make daily entries in your lab notebook, documenting the details of what you did in the lab that day. The contents of your lab notebook will serve as evidence of your participation in the labs and will be an essential resource as you write up your experiments.

- Lab notebooks are individual submissions, due at the end of the last lab in each of the 4 main modules.
- You will make one entry per lab and each entry is worth 1%, for a total of 4% per module. Half of that mark is based on content and half is based on participation.
- Lab notebooks will remain in the lab room (underneath your lab chair) all term.
- Lab attendance is mandatory and you must attend the lab to make a notebook entry for that day. Only entries made for dates you were physically in the lab and participating in the activities will be eligible for grading.

Lab Reports

The lab reports provide you with the opportunity to showcase the work your team has done in each of the main modules. Although the focus of each lab report will differ depending on the module, the overall structure will be similar, with sections for presenting background information, hypotheses and predictions, methodology, data, and interpretations.

- Lab Reports for each module are broken down into several parts: Part A is due at the end of the day of Lab 2, Part B is due at the end of the day of Lab 4. Time will be provided to complete Parts A and B during scheduled labs. Some modules have a Part C which is due after Lab 4; see the Timeline for specific dates. The due date for Part C is delayed to provide students with sufficient time to complete it outside of scheduled labs.
- Lab reports are team submissions. All team members who attended all the labs and participated fully will receive the same grade. Individual grade deductions (50% of the grade of the associated Part) will be applied to team members who were absent for any labs. For example, if you are absent from Lab 3 without Accommodations or

approved Academic Consideration, you would receive 50% of the score that your group members achieved on Part B of the Lab Report. Any student who misses all 4 labs in a module will receive 0% on the lab report.

Skills mini-module Quizzes + Activities

In the Skills mini-modules, you will learn and practice foundational skills required to conduct, and communicate about, a variety of biological experiments: laboratory skills, field skills, and AI (artificial intelligence) skills. Each Skills mini-module begins with an online activity and quiz to prepare you for the in-person activity and assignment.

- The online prep quizzes are completed individually.
- Some of the in-person activities are completed individually and some as teams.

Lab Practical

Throughout the term you'll have the opportunity to learn and practice important hands-on lab skills. You'll be assessed on your proficiency in these skills during the in-person Lab Practical at the end of the term.

- The Lab Practical is completed individually.
- You will have access to your Lab Notebook and a standard calculator during the Lab Practical.

Essential Requirements and Flexibility to Succeed

Essential Requirement: To pass this course, you must earn a final grade of at least 50%.

Flexibility to Succeed: In order to help students succeed, we have built in some flexibility to the design of most assessments:

In-Lecture Quizzes

Quiz timing is flexible: the instructor will ask you, as a class, to indicate whether you've had enough time to answer a quiz question before proceeding.

Lab Notebooks

You will be given time to complete your lab notebook entries as you are working in the lab, however, if you are unable to complete an entry on a given day you may complete it in the following lab session of that module. You will be given additional time to complete your entry in the final lab session for each module.

Lab Reports

Lab materials will be available in onQ in advance, so you can review it before and after the lab sessions. You will be given time to complete your lab report during lab time, as well as some time after (see the Timeline for due dates/times).

Skills mini-module Quizzes and Activities

The Skills prep quizzes are open for extended windows and are untimed.

The Field Skills report has a large window for submission.

Grading Scheme and Regrade Requests

All components of this course will receive numerical percentage marks. The final grade you receive for the course will be derived by converting your numerical course average to a letter grade according to Queen's Official Grade Conversion Scale, rounded to the nearest whole number:

Grade	Numerical Range	Description
A+	90-100	Exceptional
A	85-89	Outstanding
A-	80-84	Excellent
B+	77-79	Very Good
B	73-76	Good
B-	70-72	Reasonably Good
C+	67-69	Acceptable
C	63-66	Minimally Acceptable
C-	60-62	Minimally Acceptable
D+	57-59	Unsatisfactory Pass
D	53-56	Unsatisfactory Pass
D-	50-52	Unsatisfactory Pass

For more information about grade descriptions, see Queen's FAS Academic Regulations, section 10.1.1.

Assessment Regrade Requests

Please note: Only regrade requests that are made following these procedures will be considered. Also, please recognize that we cannot give or assign additional work for marks on an individual basis for any reason. We need to ensure all students in the course have the same opportunities to earn their grades, according to established grading standards.

Quizzes: If you are missing a grade for work you submitted, or believe there has been an error in the way your quiz was marked, send a regrade request to biol212@queensu.ca within one week of the quiz grades being released. Regrade requests must include:

- the name of the quiz (e.g. Cell Lecture Quiz #3)
- an explicit and clear explanation of how the work deserves a grade different than assigned

Lab and Writing Activities/Assignments: If you are missing a grade for work you submitted, or believe there has been an error in the way one of these assessments was marked:

First, within one week of the assessment grades being released, discuss the marking with the TA who marked your work.

Then, if you are unable to resolve the situation, send a regrade request to biol212@queensu.ca. Requests must be received within one week of receiving the final correspondence from your TA regarding the assignment and must include:

- your lab section and group number
- the names of all group members who wish to participate in the regrade request
 - any changes to the assessment grade will apply only to the listed members
- the name of the assignment (e.g. Cell Lab Report)
- an explicit and clear explanation of how the work deserves a different grade than assigned
- the reason(s) why discussions with your TA did not resolve the situation
- the assignment as an attached document (or photos, e.g. for lab notebooks), along with all feedback

from your TA

- your email exchanges with your TA; copy+paste all of the relevant emails, in chronological order, into a single attached PDF and/or provide a written summary of any verbal conversations

If we approve your request for a regrade, another member of the teaching team will then review your submission. It's important to note that we may reassess the entire activity/assignment (not just the portion specified in your request) and the new grade will stand, even if it is lower than the original. Depending on volume, regrade requests may not be processed until closer to the end of term.

Questions about the Course and Contacting the Teaching Team

You should be able to find the answers to most of your questions about the course in general in this **Syllabus** or in the **Timeline**. However, if you're unable to find the answer you're looking for through those means, please see the "**Contact Us**" widget on the Course Home page.

TAs will be available for questions during the labs and can be reached for certain inquiries by email (see the Teaching Team page). Course instructors are available during lectures and/or labs and monitor the question forums. Please use the course email for personal matters that can't be addressed any other way. Since the members of the teaching team who are involved in each module change regularly through the year, please only send emails to the course inbox and we will ensure your questions/concerns make it to the correct person in a timely fashion.

Please use only your Queen's email account for any email communication. Any communications sent out by us will be to this account only, so please check it regularly.

Course Announcements

Any changes to the course or any other form of announcements are made via the Announcements tool on the course homepage. We strongly encourage you to sign up to automatically receive a notice that a new announcement has been posted: instructions to Set up Your Email/SMS Notifications .

Course Feedback

At various points during the course, we may ask you to take part in a variety of feedback activities, such as surveys, questionnaires, and exit tickets.

This feedback enables us to make any adjustments necessary to improve your learning environment. Additional feedback will be sought throughout the course. All surveys are anonymous, and directly related to activities, assessments, and other course material.

Accommodations for Disabilities

Please refer to the **Accessibility and Accommodations** and the **Mental Health & Wellness** sections on the Common Course Policies and Statements website:

<https://www.queensu.ca/provost/teaching-and-learning/course-policies>

If you are a student with a disability and think you may need academic accommodations, you are strongly encouraged to contact the **Queen's Student Accessibility Services (QSAS)** and register as early as possible; see also the "QSAS Accommodations (Ventus)" button on the course homepage. For more information, including important deadlines, please visit the QSAS website.

Most assessment items in the course have academic accommodations already build into their design; please see the "Essential Requirements and Flexibility to Succeed" section in this Syllabus. However, if you require accommodations above and beyond what is already built in, please see the following:

Please note:

- To be eligible for the relevant accommodation in this course, please be sure you have selected it in Ventus for BIOL212.
- In all email correspondence regarding accommodations, you must:
 - copy (cc) your QSAS advisor
 - indicate your lab section number (e.g. 002)

In-Lecture Quizzes

Since the quiz is broken into a couple small questions over the lecture period for the purpose of class discussion, it is not possible to provide separate room accommodations. Quiz timing is flexible and quizzes are collaborative, therefore we can not provide time-based accommodations.

If you will be unable to attend a lecture or complete the in-lecture quiz for reasons related to your disability, email biol212@queensu.ca to let us know, and you will complete the make-up activity instead. The make-up activity is a short in-person discussion with the Lab Instructor about the content that was missed. The purpose of this discussion is to ensure that you have sufficient understanding of the content to be able to complete the module. This is not a presentation, it is a discussion: your grade will be assessed based on your demonstrated familiarity and understanding of the course content, not the quality of your public speaking, although clear communication is always a good idea.

During the first part of the discussion, you will have 2 minutes to provide a brief overview of the core content of the lecture you missed based on any posted lecture slides and/or associated online materials. Your objective is to demonstrate that you are familiar with the topics that were covered. For the second part of the discussion, the Lab Instructor will select one key topic and ask you some additional in-depth questions about it. The purpose of this second portion of the discussion is to demonstrate that you understand the selected topic sufficiently to be able to apply your knowledge to the module activities. The Lab Instructor may ask clarification questions to make sure they can accurately assess your understanding.

You are welcome to bring a one-page paper memory aid to refer to during your discussion (one 8.5 x 11-inch page with no restrictions on content) but keep in mind that over-reliance on written notes may indicate a lack of familiarity with the content. The entire conversation should take approximately 5 minutes (+ proportional time extension if you have a time-extension accommodation) and must be completed within 7 days of the missed lecture. It is your responsibility to schedule the in-person meeting to occur within the required window – we will not complete make-up Discussions more than 7 days later without long-term Academic Consideration. We recommend you propose at least 3 dates and times to complete this discussion when you first email to notify us you missed the lecture quiz. The easiest time to schedule a discussion is probably immediately before or immediately after your regularly scheduled lab period. Any student with accommodations for oral communication should reach out to the course inbox to discuss alternative options.

Make-up Discussions will be graded using the following scale:

- 100% = student demonstrated complete familiarity of core content from missed activity and associated online materials, and an excellent understanding of the key topic assessed without any prompting from Lab Instructor
- 75% = student demonstrated familiarity with most of the core content from the missed activity and a good understanding of the key topic assessed with some prompting from Lab Instructor
- 50% = student demonstrated familiarity with only some of the core content from the missed activity, and a basic understanding of the key topic assessed
- 25% points = student demonstrated limited familiarity with content from missed activity, either missing major components or requiring extensive use of written notes. Student demonstrated inaccurate understanding of the key topic assessed
- 0% = student did not demonstrate a familiarity with content from missed activity or the key topic assessed

A similar approach will be used for the Guest Lecture: if you will be unable to attend for reasons related to your disability, email biol212@queensu.ca to let us know, and instead you will complete an in-person discussion with the Lab Instructor based on an assigned reading related to the Guest Lecture topic.

A note about Lab Attendance

Students may occasionally need to miss lab sessions for reasons related to their disability. However, lab participation is an important component of the course and is required to support achievement of the course learning outcomes. If you are absent for more than two of your assigned lab sessions in a module, please meet with a course instructor to discuss available options and next steps. In cases of extensive absences, alternative assessments may not be feasible.

Lab Notebooks

Though lab notebooks are meant to stay in the lab at all times, if you feel you require extra time to complete your Lab 1–3 entries, you may take your lab notebook home with you after lab and bring it back with you for the following lab.

As notebooks will be graded at the end of each module, they must remain in the lab after Lab 4. If you are unable to complete your Lab 4 entry during lab time for reasons related to your disability, leave a note in your Lab 4 entry indicating this, and your entry will be pro-rated based on the other three entries for that module.

If you are unable to attend one of your assigned lab sessions in a module for reasons related to your disability, email biol212@queensu.ca before the end of the day of your lab and we will pro-rate the grade for that day's lab notebook entry based on the other three entries for that module.

If you are unable to attend two of your assigned lab sessions in a module for reasons related to your disability, email biol212@queensu.ca before the end of the day of the second missed lab and you will be eligible to complete a make-up assignment to cover your missing lab notebook grades.

Lab Reports

It is not possible to have individual accommodations for time or provide extensions for group based activities like the Lab Reports; we offer time during lab to finish these assignments.

If you are absent for one of your assigned lab sessions in a module for reasons related to your disability, email biol212@queensu.ca before the end of the day of your lab and you will not receive any deductions on your Lab Report for missing that session (this applies to any of the labs in a module).

If you are absent for two of your assigned lab sessions in a module for reasons related to your disability, email biol212@queensu.ca before the end of the day of the second missed lab and you will be eligible to complete a make-up assignment to cover the portion of the lab report grade you have missed.

Skills mini-Modules

Prep Quizzes

These are designed to prepare you for the upcoming associated activity, so no extensions can be provided.

If you are unable to write a prep quiz for reasons related to your disability, email biol212@queensu.ca before the due date and your grade will be pro-rated based on your other Skills mini-modules grades.

Activity/Assignment

Due to the nature of these activities/assignments, no extensions can be provided.

If you are unable to participate in a skills lab or the field trip for reasons related to your disability, email biol212@queensu.ca before the end of the day of the activity to be eligible for the following:

- Lab Skills: You will be contacted to arrange a Make-up lab skills session to complete the activity. If you are unable to attend the make-up session your grade will be pro-rated based on your Lab Practical grade.
- Field and AI Skills: make-up assignment

Lab Practical

If you are unable to participate in the Lab Practical for reasons related to your disability, email biol212@queensu.ca before the end of the day of your scheduled session to be eligible to attend a make-up session. If you are also unable to participate in the scheduled make-up session, let us know and we will find another mutually convenient time to complete the Lab Practical before the end of the exam period.

Academic Consideration for Students in Extenuating Circumstances

Please refer to the **Accessibility and Accommodations** section - specifically, sub-sections 2.2.3 and 2.2.4 - on the Common Course Policies and Statements website:

<https://www.queensu.ca/provost/teaching-and-learning/course-policies>

How to Apply for Academic Consideration

Each Faculty has developed a protocol to provide a consistent and equitable approach in dealing with requests for academic consideration for students facing extenuating circumstances. Arts and Science undergraduate students can find the Faculty of Arts and Science protocol and the portal where a request can be submitted. Students in other Faculties and Schools who are enrolled in this course should refer to the protocol for their home Faculty.

For guidance on submitting requests, please refer to the information available on the Academic Consideration website under "Applying for Academic Consideration."

If you need to request academic consideration for this course, you will be required to provide the following name and email address to ensure it reaches our team accordingly:

- Instructor/Course Coordinator Name: Barb Vanderbeld

- Instructor/Course Coordinator email address: biol212@queensu.ca

We can only offer Considerations to students who submit their academic consideration requests following this method. Please do not contact your instructors or TAs, as all requests must go through the Faculty of Arts and Science office.

Students are encouraged to submit requests as soon as the need becomes apparent, as any delay in doing so may limit the Consideration options available.

Options Available in BIOL 212 for Students with Approved Academic Consideration

For students with approved academic consideration for dates spanning the assessment/activity, we can offer the following:

In-Lecture Quizzes

If you have an approved absence on the day of a lecture and are unable to attend, email biol212@queensu.ca to let us know, and you will complete the make-up activity instead. The make-up activity is a short in-person discussion with the Lab Instructor about the content that was missed. The purpose of this discussion is to ensure that you have sufficient understanding of the content to be able to complete the module. Please see a full description of this make-up activity in the "Accommodations for Disabilities" section above.

The make-up discussion must be completed within 7 days of the missed lecture. It is your responsibility to schedule the in-person meeting to occur within the required window – we will not complete make-up Discussions more than 7 days later without long-term Academic Consideration. You are welcome to reach out to us about scheduling your discussion while you are waiting for your consideration request to be confirmed/approved.

Guest Lecture: a similar approach will be used for the Guest Lecture. Please see a full description in the "Accommodations for Disabilities" section above.

A note about Lab Attendance

Students may encounter extenuating circumstances that persist for lengthy periods of time. However, lab participation is an important component of the course and is required to support achievement of the course learning outcomes. If you have an approved absence for more than two assigned lab sessions in a module, we will need to discuss available options and next steps. In cases of extensive absences, alternative assessments may not be feasible, and you may be referred to an Academic Advisor to explore appeal options (including a late drop of the course).

Lab Notebooks

If you have an approved absence on the day of one of your assigned lab sessions in a module and are unable to attend, we will automatically pro-rate the grade for that day's lab notebook entry based on the other three entries for that module.

If you have an approved absence for two of your assigned lab sessions in a module and are unable to attend, you will automatically be eligible to complete a make-up assignment to cover your missing lab notebook grades.

Lab Reports

If you have an approved absence on the day of one of your assigned lab sessions in a module and are unable to attend, you will not receive any deduction to your lab report grade for missing that session.

If you have an approved absence for two of your assigned lab sessions in a module and are unable to attend, you will automatically be eligible to complete a make-up assignment to cover the portion of the lab report grade you have missed.

Skills mini-Modules

Prep Quizzes

If you have an approved absence that spans the availability window of the quiz and are unable to complete the quiz, your grade will be pro-rated based on your other Skills modules grades.

Activity/Assignment

- **Lab Skills:** If you enrolled in the course late or have an approved absence on the day of your scheduled laboratory skills and are unable to attend, you will be contacted to arrange a make-up lab skills session to complete the activity. If you are unable to attend the make-up session your grade will automatically be pro-rated based on your Lab Practical grade.
- **Field and AI Skills:** If you have an approved absence on the day of your scheduled lab or field trip, you will be automatically eligible to complete the make-up assignment.

Lab Practical

If you have an approved absence on the day of your scheduled Lab Practical, you will automatically be eligible to attend a make-up session. If you also have an approved absence on the day of the make-up session(s), we will find another mutually convenient time to complete the Lab Practical before the end of the exam period.

Academic Integrity

Please refer to the **Academic Integrity** section on the Common Course Policies and Statements website:

<https://www.queensu.ca/provost/teaching-and-learning/course-policies>

Notes about the use of Artificial Intelligence Tools in BIOL212

Unauthorized use of **Large Language Model (LLM) artificial intelligence (AI) generative text** software (e.g. ChatGPT or other similar software) is not permitted in this course. Submitting work written wholly or partially by generative AI software for grades is considered plagiarism. We may explore the use of generative AI software for academic writing; if so, permission to use AI software will be clearly presented in written form. If you do not see written authorization explicitly stated for an activity, you should assume that using AI in any generative way is not permitted. AI software may be used in BIOL212 for minor text editing (e.g. spelling and grammar changes) but cannot be used to make major changes to your writing submissions. It is expected that any AI usage does not alter the content of the student generated text, and that any AI usage will be cited appropriately (see below).

If LLM AI software is used, in any way, it must be cited appropriately. While there are no commonly established rules for citing AI we will use the format outlined below. Any text edited by AI must include a statement at the beginning of the document briefly describing how the AI was used for editing purposes, followed by a citation in the following

format (LLM Software name, Year of LLM reference; see Appendix X for the full transcript). Original prompts and complete AI outputs should then be included in an appendix. Finally, your AI software should be listed in your cited literature in the following format.

AI Publisher. (Year of AI citation). *AI software name* (Date of version used) [Large language model]. Hyperlink to AI software.

For example if using ChatGPT, published by OpenAI, one might use the following citations.

In-text citation:

(OpenAI, 2023; see Appendix A for the full transcript)

Literature citation:

OpenAI. (2023). *ChatGPT* (Mar 14 2024 version) [Large language model]. <https://chat.openai.com/chat>

Agentic AI tools are applications that can act autonomously on a user's behalf: completing tasks, accessing systems, and making decisions without continuous human direction. Examples include automated agents that can submit assignments, complete online activities, or interact with course platforms.

The use of agentic AI to complete, submit, or contribute to assessed work is not permitted in this course. This applies regardless of any permissions granted for the use of generative AI tools. When a tool acts on your behalf, the resulting work is not your own; this falls within existing definitions of departures from academic integrity.

You must not authorize any third-party tool or application to access Queen's systems, including onQ, using your institutional credentials. Doing so creates risks that extend beyond your own academic standing.

Technology Use

Please refer to the **Technology Use** section on the Common Course Policies and Statements website for information about IT use, Turnitin and Copyright:

<https://www.queensu.ca/provost/teaching-and-learning/course-policies>

Web Browsers

onQ performs best when using the most recent version of the web browsers, Chrome or Firefox. Safari and Edge are strongly discouraged as these web browsers are known to cause issues with onQ.

Internet Speed

While a wired Internet connection is encouraged, we recognize that most students rely on a wireless connection. A minimum download speed of 10 Mbps and up to 20 Mbps for multimedia is recommended. Click here for an Internet speed test.

Technical Support

For technology support ranging from setting up your device, issues with onQ to installing software, contact ITS Support Centre.

Photo Consent

From time to time, your instructor or TA may ask for your verbal consent to have your photo taken. Photos of students participating in course-related activities may be used for promotional and outreach purposes, and may be posted on course or department websites or in course or outreach materials. Students are not required to consent to having their photograph taken: if you do not wish to be included in a photograph, simply tell the instructor or TA and move out of frame.

For more information, please see:

queensu.ca/accessandprivacy/guidance/taking-and-using-images-consent