Course Information

General Course Information

Course: BIOL334
Course title: Comparative Biochemistry
Pre-requisites: BIOL103 and CHEM112 and (BIOL205 or BCHM218)
Semester and year: Winter 2025
Number of credits: 3.0
Learning hours: 120
Modality (on campus, blended, or online): On campus
Classroom accessibility: Consult Queen's Auditorium guide

Course Description

A survey of selected topics including general principles of enzymology; bioenergetics; metabolism and its control; the importance of proteomic and enzyme research in functional genomics and biotechnology; mechanisms whereby animals and plants acclimate at the biochemical level to environmental stress. *NOTE Preference will be given to students registered in a Biology degree program or who require this course for their program.*

Topics

Week	Module
1-5	Unit 1 – Background of Metabolism
5-10	Unit 2 – Examples of Biochemical Adaptation
10-12	Poster Presentation / Conference

Course Learning Outcomes

On successful completion of this course, students will be able to:
1. Compare and contract various aspects of metabolism and its control.
2. Describe the strategies by which diverse organisms from the various kingdoms of life alter the basic biochemical plan to meet the challenges of living in a wide range of environments.
3. Appreciate the connections between biochemical adaptation and survival.
4. Describe the fundamental similarities and distinctions between animals, plants, and microbial metabolism.
5. Explain how various species can survive in 'extreme' environments.
6. Understand how adaptation relates at the biochemical and metabolic level of biological organization.
7. Critically evaluate the scientific literature when conducting a literature review of a selected topic.
8. Prepare a proposal that demonstrates preliminary understanding of a topic.
9. Prepare and present an academic poster that communicates the current understanding of a chosen topic.
10. Engage with their peers in academic conversation during a virtual conference.
11. Conduct a peer review of a conference poster with the aid of a rubric.
12. Work collaboratively in a group or team.

Important University Dates

Please visit the Faculty of Arts and Sciences Sessional Dates website for all academic deadlines.

Inclusion

Land Acknowledgement

Let us acknowledge that Queen's University occupies 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 and whose practices and spiritualties are tied to the land and continue to develop in relationship to the territory and its other inhabitants today. Indigenous communities in Kingston/Katarokwi continue to reflect the area's Anishinaabe and Haudenosaunee roots. There is also a significant Métis community and First Peoples from other Nations across Turtle Island present here today. To read more about the history of the land, see the Queen's Encyclopedia and to learn more about land acknowledgements, see the Office of Indigenous Initiatives.

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. In this class I will work to promote an anti-discriminatory, anti-racist and accountable environment where everyone feels welcome. Every member of this class is asked to show respect for every other member.

Building a Classroom Community

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 safer, more respectful classroom community for learners by following these guidelines:

- Make a personal commitment to learn about, understand, and support your peers.
- Assume the best of others and expect the best of them.
- Recognize and value the experiences, abilities, and knowledge each person brings to the course.
- Acknowledge the impact of oppression on other people's lives and make sure your words and tone are respectful and inclusive.
- Encourage others to develop and share their ideas.
- Pay close attention to what your peers say/write before you respond. Think through and re-read what you have written before you post online or send your comments to others.
- Be open to having your ideas challenged and challenge others with the intent of facilitating growth.
- Look for opportunities to agree with one another, building on and intentionally referencing peers' thoughts and ideas; disagree with ideas without making personal attacks, demeaning, or embarrassing others.

Fostering Accessibility

All of us have a shared responsibility for fostering accessibility and promoting meaningful inclusion of those with disabilities. The Accessibility Hub at Queen's University's Human Rights & Equity Office offer a host of tutorials that provide us all with practical tips for:

- creating accessible documents, e.g., to submit to your teaching team or share with peers in peer feedback activities/in a presentation,
- emails, e.g., while communicating with group members or your teaching team, and
- meeting practices (e.g., in tutorials/labs/seminars or virtual meetings.

Name/Pronoun

If, for whatever reason, you wish to change how your name appears in onQ and/or on class lists, please follow these steps. You may also use this process to add your pronouns to the appearance of your name.

1. Log into SOLUS.
2. Click on Personal Information tab.
3. Click on the Names tab
4. Click on the Add New Name tab
5. Choose Preferred from the Name Type drop down menu
6. Enter the name you would like to appear in onQ and/or on class lists.
7. Click Save.

Please allow 24 to 48 hours for your name to be registered within the system. If you have further questions or concerns, please contact ITS at Queen's University.

Course Materials & Technologies

No text is required but it may be helpful to have access to an upper-level biochemistry text for the basic pathways.

If students would like access to a biochemistry textbook, they are encouraged to use an online textbook available via an open license.

Any supplemental readings will be made available on onQ. Students will be notified of any supplemental readings through onQ and by announcements.

Educational Technologies, Help, Privacy, and Accessibility

This course makes use of the following website(s), program(s), and/or application(s) for specific educational use/purposes.

Privacy: Be aware that your independent use of the website(s), programs, and/or application(s) used in this course*, beyond what is required,* is subject to their terms of use and privacy policy. You are encouraged to review the applicable privacy statements before using the site. Please see below.

Accessibility: Queen's University is committed to developing courses that are accessible. For further information on accessibility compliance of the website(s), program(s) application(s) used in the course, please consult the links below.

Software	Use	Support	Privacy	Accessibility
onQ	Online learning	Queen's IT	Queen's IT	Queen's IT
Microsoft Teams	Collaborative learning	Queen's IT	Queen's IT	Queen's IT
FeedbackFruits	Peer learning	Queen's IT	Queen's IT	Queen's IT

Copyright of Course Material

Course materials created by the course instructor, including all slides, presentations, handouts, tests, exams, and other similar course materials, are the intellectual property of the instructor. It is a departure from academic integrity to distribute, publicly post, sell or otherwise disseminate an instructor's course materials or to provide an instructor's course materials to anyone else for distribution, posting, sale or other means of dissemination, without the instructor's express consent. A student who engages in such conduct may be subject to penalty for a departure from academic integrity and may also face adverse legal consequences for infringement of intellectual property rights.

Communication

Questions about the Course and Contacting the Teaching Team

Please see onQ page for information about contacting the teaching team.

Queen's Email

The university communicates with students via Queen's email. Please check your email regularly to ensure you do not miss important information related to your course.

Course Feedback

At various points during the course, you may be asked to take part in a variety of feedback activities, such as surveys and questionnaires. This feedback enables the teaching team to improve the course. All surveys are anonymous and are directly related to activities, assessments, and other course material.

Assessments

Weighting and Alignment with Course Learning Outcomes (CLOs)

Assessment	Alignment with CLOs	Weighting
Content Quizzes (best 8 of 9)	CLO 1-6	20%
Poster Presentation / Conference - Proposal	CLO 7, 8, 12	7%
Poster Presentation / Conference - Presentation	CLO 7, 9, 12	25%
Poster Presentation / Conference - Peer Review	CLO 7, 11	4%
Poster Presentation / Conference - Discussion	CLO 7, 10, 12	6%
Poster Presentation / Conference - Summary Report	CLO 7, 10	2%
Poster Presentation / Conference – Group Evaluation	CLO 12	1%
Final Exam	CLO 1 - 6	35%
Total		100%

Descriptions of Learning Activities and Assessments

Assessment 1
Content Quizzes: Testing of the concepts from lecture. (Individual Assessment)

Assessment 2
Poster Presentation / Conference – Proposal: Groups select a topic that relates to comparative biochemistry and/or biochemical adaptation and write a proposal for the poster that will be presented during the virtual conference. (Group Assessment)

Assessment 3
Poster Presentation / Conference – Presentation: Groups prepare a poster and an accompanying presentation that will be displayed during the virtual conference. (Group Assessment)

Assessment 4
Poster Presentation / Conference – Peer Review: Students peer review each other's poster presentations with the aid of a rubric. (Individual Assessment)

Assessment 5
Poster Presentation / Conference – Discussion: Students engage in discussion with each other's poster presentations during the virtual conference. (Individual/Group Assessment)

Assessment 6
Poster Presentation / Conference – Summary Report: Students prepare a summary report based on their engagement and participation during the conference. (Individual Assessment)

Assessment 7
Poster Presentation / Conference – Group Evaluation: Students evaluate the teamwork skills of each member of their group from preparatory stages to engagement during the Conference (Individual Assessment)

Assessment 8
Final Exam – This course has a final exam that tests all concepts from the course. (Individual Assessment)

Proctored Exams

Timing of Final Examinations
Once the exam schedule has been finalized, the exam date will be posted on your SOLUS account. The exam dates for each term are listed on the Faculty of Arts and Science webpage under "Important Dates." Student exam schedules for the Fall Term are posted on SOLUS immediately prior to Thanksgiving and on the Friday before Reading Week for the Winter Term. **Students should delay finalizing any travel plans until after the examination schedule has been posted. Exams will not be moved or deferred to accommodate employment, travel/holiday plans or flight reservations. For information regarding what is considered extenuating circumstances and qualifications for Academic Consideration, please visit the** Faculty of Arts and Science's Academic Consideration webpage.

Assessment Submission Policy

Written Submissions: The written submissions (Proposal, Peer Review, Group Evaluation and Summary Report) have a built-in three-day grace period, which aligns with the Faculty of Arts and Science's policy for Academic Considerations. If you have extenuating circumstances when a submission is due, and these circumstances will last up to three (3) days, you can use the grace period without applying for formal Academic Considerations through the Portal. The grace period is automatically applied to work submitted

up to three (3) days late. However, if your circumstances will last more than three (3) days and you have documentation, please use the Academic Considerations Portal.

Content Quizzes: These are a series of weekly quizzes. Each quiz has a built-in FOUR-day grace period, which aligns with the Faculty of Arts and Science's policy for Academic Considerations. If you have extenuating circumstances when this quiz is due, and these circumstances will last up to four (4) days, you can use the grace period without applying for formal Academic Considerations through the Portal. The grace period is automatically applied to this quiz submitted up to four (4) days late. However, if your circumstances will last more than four (4) days and you have documentation, please use the Academic Considerations Portal. Students will have one attempt each quiz, and the best 8 of 9 quizzes will be used when determining the grade for this assessment. No extensions after the grace period has concluded will be available to students regardless of accommodations or consideration.

Conference Poster Presentation and Conference Discussions: The conference poster presentation and conference discussions do NOT have built-in grace periods. This is because of the interactive and time-sensitive nature of these assessments. Thus, students are asked to use the Academic Considerations Portal when relevant for these assessments and contact the instructor.

Please see the Academic Considerations for Students with Extenuating Circumstances and Accommodations for Disabilities sections of the syllabus for more information.

Policy Review of Graded Work

Requests for assignment regrading may be made to the teaching team 48 hours after you have received the marked copy of your assessment, but no more than 10 days later. Be sure to read the feedback you received carefully BEFORE you submit a review of graded work. To request that your assessment be reviewed, you must include the following in your request and submit it to the appropriate Regrade Request dropbox on onQ:

- Your name and student number
- Your reason for the request:
    - The specific aspects of your assessment that you believe were not sufficiently awarded, referring to the categories of the rubric.
    - Why you believe that your assessment meets the criteria for a higher mark for each of the categories of the rubric that you indicated above. Please make explicit reference to the detailed descriptions of each category provided in the rubric.
- A copy of the original assessment

All regrade requests must abide by these instructions. Any omission of the required documentation or information will exclude the assessment from being eligible for a regrade.

If a review of graded work results in only a slightly different final grade, the original grade will stand. Should we find an error where marks were not assigned when they should have been or were missed in adding up the total score or were added up incorrectly resulting in a higher score than earned, the grade will be changed so that it is accurate. Grades would only increase or decrease if there was evidence of an error in marking, not simply because the regrader interprets or applies the rubric slightly differently than the original grader.

Policies

Class Attendance

Your presence and participation in class contributes to the knowledge and skills that you will develop throughout this course. I expect that you attend class regularly, participate in class conversations and learning activities. These types of activities provide active engagement, promote a deeper understanding of the course content, and contribute to your success in this course. **Lectures will not be recorded.**

Academic Support

All undergraduate students face new learning and writing challenges as they progress through university: essays and reports become more complex; effectively incorporating research into writing becomes more important; the types of assignments become more diverse; managing your time and developing the skills you need to read and think critically gets more challenging. I encourage students to contact Student Academic Success Services (SASS). SASS offers many different ways to receive support:

- Free online or in-person appointments to get personalized support on writing and academic skills from expert staff and trained peers.
- Workshops and drop-in programs. SASS' Events Calendar lists events coming soon.
- Online resources that provide strategies for academic skills and writing development at university.
- If English is not your first language, SASS has specific resources for English as Additional Language students, including weekly programs and EAL academic skills appointments. You can meet on an ongoing basis with an EAL consultant to work on your academic writing, speaking, listening, and reading skills.

Accommodations for Disabilities

Queen's University is committed to working with students with disabilities to remove barriers to their academic goals. Queen's Student Accessibility Services (QSAS), students with disabilities, instructors, and faculty staff work together to provide and implement academic accommodations designed to allow students with disabilities equitable access to all course material (including in-class as well as exams). If you are a student currently experiencing barriers to your academics due to disability related reasons, and you would like to understand whether academic accommodations could support the removal of those barriers, please visit the QSAS website to learn more about academic accommodations or start the registration process with QSAS by clicking ***Access Ventus*** button at **Ventus | Accessibility Services | Queen's (queensu.ca)**.

VENTUS is an online portal that connects students, instructors, Queen's Student Accessibility Services, the Exam's Office and other support services in the process to request, assess, and implement academic accommodations.

To learn more go to: https://www.queensu.ca/ventus-support/students/visual-guide-ventus-students

Academic Consideration for Students in Extenuating Circumstances

Academic Consideration is a process for the University community to provide a compassionate response to assist students experiencing unforeseen, short-term extenuating circumstances that may impact or impede a student's ability to complete their academics. This may include but is not limited to,

- Short term Physical or Mental Illness or Injury (stomach flu, anxiety/depression, mononucleosis, concussion, broken bones, surgery, medical treatments, etc.)
- Traumatic Event/Confidential (Bereavement, serious injury, illness or required treatment for a significant other/family member or a traumatic event such as divorce, sexual assault, social injustice, etc.)
- Requirements by Law or Public Health Authorities (court dates, jury duty, requirements to isolate, etc.)
- Significant Event (varsity athletic event, distinguished event, serving in the Reserve Forces, etc.)

Queen's University is committed to providing academic consideration to students experiencing extenuating circumstances. For more information, please see the Senate Policy on Academic Consideration for Students in Extenuating Circumstances.

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. For more information, undergraduate students in the Faculty of Arts and Sciences should consult the Faculty's webpage on Academic Consideration in Extenuating Circumstances and submit a request via the Academic Consideration Request Portal. Students in other Faculties and Schools who are enrolled in this course should refer to the protocol for their home Faculty.

Students are encouraged to submit requests as soon as the need becomes apparent and to contact their instructor and/or course coordinator as soon as possible once academic consideration has been granted. Any delay in contact may limit the options available for academic consideration.

For more information on the Academic Consideration process, what is and is not an extenuating circumstance, and to submit an Academic Consideration request, please see the Faculty of Arts and Science's Academic Consideration website. ASO courses include links to information on **Academic Consideration** on your **Course Homepage** in onQ.

Please see the Teaching Team page for contact information for your instructor and TA(s), where relevant.

Queen's Policy Statement on Academic Integrity
Queen's University is dedicated to creating a scholarly community free to explore a range of ideas, to build and advance knowledge, and to share the ideas and knowledge that emerge from a range of intellectual pursuits. Queen's students, faculty, administrators and staff therefore all have responsibilities for supporting and upholding the fundamental values of academic integrity. Academic integrity is constituted by the five core fundamental values of honesty, trust, fairness, respect and responsibility and by the quality of courage. These values and qualities are central to the building, nurturing and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University.

The following statements from "The Fundamental Values of Academic Integrity" (2nd edition), developed by the International Center for Academic Integrity (ICAI), contextualize these values and qualities:

1. **Honesty:** Academic communities of integrity advance the quest for truth and knowledge through intellectual and personal honesty in learning, teaching, research, and service.
2. **Trust:** Academic communities of integrity both foster and rely upon climates of mutual trust. Climates of trust encourage and support the free exchange of ideas which in turn allows scholarly inquiry to reach its fullest potential.

3. **Fairness:** Academic communities of integrity establish clear and transparent expectations, standards, and practices to support fairness in the interactions of students, faculty, and administrators.
4. **Respect:** Academic communities of integrity value the interactive, cooperative, participatory nature of learning. They honour, value, and consider diverse opinions and ideas.
5. **Responsibility:** Academic communities of integrity rest upon foundations of personal accountability coupled with the willingness of individuals and groups to lead by example, uphold mutually agreed-upon standards, and take action when they encounter wrongdoing.
6. **Courage**: To develop and sustain communities of integrity, it takes more than simply believing in the fundamental values. Translating the values from talking points into action -- standing up for them in the face of pressure and adversity — requires determination, commitment, and courage.

Students are responsible for familiarizing themselves with and adhering to the Senate [regulations](#) concerning academic integrity, along with [Faculty or School](#) specific information. Departures from academic integrity include, but are not limited to, plagiarism, use of unauthorized materials, facilitation, forgery and falsification. Actions which contravene the regulation on academic integrity carry sanctions that can range from a warning, to loss of grades on an assignment, to failure of a course, to requirement to withdraw from the university.

Syllabus statements for Generative Artificial Intelligence (AI) Tools

Not permitted: Using generative AI writing tools such as ChatGPT in your submitted work is not permitted in this class. This type of use constitutes a Departure from Academic Integrity. Original work, completed wholly by you, is expected to be submitted in this course. The use of an artificial intelligence tool like ChatGPT is not permitted.

Queen's [Student Academic Success Services](#) (SASS) offers a self-directed, online academic integrity module which we encourage all students to take which will help with:
- Understanding the nature of the academic integrity departure
- Understanding the expectations of and role of sources in scholarly writing
- Integrating sources into your writing (paraphrasing, quoting, summarizing)
- Understanding when and how to cite your sources
- Managing your time effectively to avoid the need for shortcuts
- Taking effective notes to ensure accuracy of source material and correct attribution

Turnitin Statement

This course makes use of Turnitin, a third-party application that helps maintain standards of excellence in academic integrity. Normally, students will be required to submit their course assignments through onQ to Turnitin. In doing so, students' work will be included as source documents in the Turnitin reference database, where they will be used solely for the purpose of detecting plagiarized text in this course. Data from submissions is also collected and analyzed by Turnitin for detecting Artificial Intelligence [(AI)-generated text](#). These results are not reported to your instructor at this time but could be in the future.

Turnitin is a suite of tools that provide instructors with information about the authenticity of submitted work and facilitates the process of grading. The similarity report generated after an assignment file is

submitted produces a similarity score for each assignment. A similarity score is the percentage of writing that is similar to content found on the internet or the Turnitin extensive database of content. Turnitin does not determine if an instance of plagiarism has occurred. Instead, it gives instructors the information they need to determine the authenticity of work as a part of a larger process.

Please read Turnitin's [Privacy Policy](#), [Acceptable Use Policy](#) and [End-User License Agreement](#), which govern users' relationship with Turnitin. Also, please note that Turnitin uses cookies and other tracking technologies; however, in its service contract with Queen's Turnitin has agreed that neither Turnitin nor its third-party partners will use data collected through cookies or other tracking technologies for marketing or advertising purposes.

For further information about how you can exercise control over cookies, see [Turnitin's Privacy Policy](#).

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