
Evolution in Action

BIOL 535 Winter 2024

CALENDAR DESCRIPTION

While evolution has shaped the biodiversity we see on earth over millennia, it also shapes our daily lives and has numerous applications in scientific research, health and industry. Principles of quantitative and population genetics are applied to the scope of contemporary evolution, including experimental applications and rapid change during biological invasions and disease outbreaks.

Instructor	
Instructor Contact	
Office Hours	TBA
TAs:	N/A
TA Office Hours	N/A

Learning Objectives

As instructor my goals are firstly to engage you in the study of evolution and genetics using contemporary examples as a matrix. As second and third major goals, I hope to promote critical thinking about scientific endeavours and improve your comprehension and writing skills. To these ends the course uses a mixture of lectures, interactive tutorials, and written projects. In particular, I ask you to translate scientific research from original published papers and communicate a summary of the area via a research seminar and paper. By the end of the course, you should have:

- A solid understanding of evolutionary principles that can be applied broadly to the biotic world.
- An appreciation of the diversity and importance of contemporary evolutionary processes.
- Improved research, writing and presentation skills.

Learning Hours

<i>Teaching method</i>		<i>Average hours per week</i>	<i>Number of weeks</i>	<i>Total hours</i>
In-class hours	Lecture			
	Seminar	3	12	36
	Laboratory			
	Tutorial			
	Practicum			
	Group learning			
	Individual instruction	1	6	6
Other	Online activity	3	6	18
	Off-campus activity			
	Private study	5	12	60
Total hours on task				122

Course Outline: Main Topics

- The diversity and importance of contemporary evolution.
- Applications: using experimental evolution to understand evolution.
- Applications: experimental evolution for engineering, drug development, agriculture.
- Evolution during biological invasions and disease outbreaks.
- Evolution of resistance to drugs, pesticides and herbicides.
- Numerous examples brought forward in the seminars by participants.

Textbooks/Readings

Assigned and recommended readings vary from year to year and will be available via OnQ.

Grading Scheme

Component	Weight	Dates
Proposal	10%	Feb. 9th
Presentation	20%	Between March 4 - April 1 st
Major Paper	30%	April 5 th
Take Home Exam	20%	Feb 16 – 30 th
Peer Feedback & Participation	20%	TBD

Late Policy

Short written assignments that are intended to prepare students for the tutorials are due at the beginning of the week. They will not be accepted late unless special arrangements have been made for extenuating circumstances. For the Major Paper, a penalty of 5% per day late, and 5% per weekend will be charged. For sake of clarity, a day ends at 5PM.

Grading Method

In this course, some components (e.g., participation) may be graded using numerical marks. Other components may receive letter grades, which for purposes of calculating your course average will be translated into numerical equivalents using the Faculty of Arts and Science Letter Grade Input Scheme. When letter grades are employed, the following scale will be employed for purposes of calculating your course average:

Arts & Science Letter Grade Input Scheme

Assignment mark	Numerical value for calculation of final mark
A+	93
A	87
A-	82
B+	78
B	75
B-	72
C+	68
C	65
C-	62
D+	58
D	55
D-	52
F48 (F+)	48
F24 (F)	24
F0 (0)	0

Your course average will then be converted to a final letter grade according to Queen's Official Grade Conversion Scale:

Queen's Official Grade Conversion Scale

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	49 and below

Academic Integrity and Queen's Code of Conduct

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and conduct conform to the principles of academic integrity. Information is available in the Arts and Science Calendar (see Academic Regulation 1 - <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations>, on the Arts and Science website (see <http://www.queensu.ca/artsci/academics/undergraduate/academic-integrity>), and at Biology's website (<http://www.queensu.ca/biology/undergrad/integrity.html>) and from the instructor of this course. Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulations on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

Accommodation Policy, Exam Conflicts, and Other Conflicts

Students who feel they need accommodations for disabilities or extenuating circumstances, or have a conflict between exams or other commitments should consult the Biology Department's website for details about how to proceed (<http://www.queensu.ca/biology/undergrad/integrity.html>). In general, the earlier a course coordinator is apprised of an extenuating circumstance, the more likely an accommodation can be made. Students are encouraged to be proactive in anticipating difficulties, when it is possible to do so.

Students may apply to write a make-up or deferred exam if they have an exam conflict as defined in the Academic Regulations of the Faculty (See Arts and Science Calendar Regulation 8 - <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations>). In this case, the student should report to the Exams Office first to verify that there is a genuine exam conflict. Biology professors will not consider your situation to be a conflict unless it meets the criteria set out by the Faculty of Arts and Sciences.

Students may request a make-up or deferred exam if they have an exam conflict with off-campus travel associated with a field course (e.g BIOL-307/3.0 or 407/3.0) that is held during the fall or winter terms.

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Accommodation of Disabilities

Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact the Disability Services Office (DSO) and register as early as possible. For more information, including important deadlines, please visit the DSO website at: <http://www.queensu.ca/hcds/ds/>