
BIOL 442
Evolutionary Medicine
Fall Term (2021)

CALENDAR DESCRIPTION

An exploration of human disease, illness, and injury, and the symptoms and treatments of medical conditions, with an evolutionary framework.

Learning Hours: 120 (24L; 20T; 10O; 66P)

Prerequisite: BIOL 206/3.0 and a minimum GPA of 2.0 in the Biological Foundations List

SCHEDULE

TBD, see OnQ site for details.

Instructor	Dr. Fran Bonier
Instructor Contact	bonierf@queensu.ca

Learning Objectives

The goal of Biology 442 is to guide students in applying an evolutionary framework to better understand human medical conditions and illnesses, and to deepen students' understanding of fundamental evolutionary concepts. In the process, students will improve their critical thinking and communication skills, in part through participation in tutorial debates and preparation of a final science communication assignment.

Learning Hours (note, these apply to the in-person version of this course – roughly the same amount of time will be invested in BIOL442 this semester, though some content may be online)

<i>Teaching method</i>		<i>Average hours per week</i>	<i>Number of weeks</i>	<i>Total hours</i>
In-class hours	Lecture	2	12	24
	Seminar			
	Laboratory			
	Tutorial	2	10	20
	Practicum			
	Group learning			
Other	Online activity	1	10	10
	Off-campus activity			
	Private study	6	11	66
Total hours on task				120

Course Outline

More information can be found at the course OnQ site

Overview of some topics to be covered in the course:

1. The scientific method and hypothesis testing
2. Why Evolutionary medicine?
3. Fundamental evolutionary theory
4. Evolution of virulence
5. Antibiotic resistance
6. Vaccine-driven evolution
7. Zoonoses and disease emergence
8. Human evolution: defenses and disease
9. Evolutionary environmental mismatch
10. Developmental origins of health and disease
11. Life history tradeoffs, familial fitness conflicts, and human health
12. Cancer

Textbooks/Readings

Recommended text: *Evolutionary Medicine* (first edition, 2016) by Stearns and Medzhitov – students can opt to purchase a hard copy book (available at the Queen’s Bookstore, and through other vendors) or an e-copy (available at coursesmart.com as well as other vendors).

Other readings from the primary literature to be provided on the OnQ site

Grading Scheme – this breakdown for marks in BIOL442 is subject to change.

Component	Weight (%)
Quizzes	40%
Science Communication project	30%
Tutorial assignments	24%
Participation	6%

Grading Method

In this course, all components will be graded using numerical percentage marks. Your course average will then be converted to a final letter grade according to 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 <https://www.queensu.ca/artsci/students-at-queens/academic-integrity>), on the Biology Department website (<http://biology.queensu.ca/academics/undergraduate/prepare-yourself/>), 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 that 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 should consult the University Student Accessibility Services (<http://www.queensu.ca/studentwellness/accessibility-services>). Students with a conflict between exams, lectures, or other course requirements should consult the Biology Department's website for details about how to proceed (<http://biology.queensu.ca/academics/undergraduate/prepare-yourself/>). In general, the earlier the instructor 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.

Make-up quizzes will not be offered, but students who have made **PRIOR** arrangements using the **Queen's University Academic Consideration Request system** (<https://webapp.queensu.ca/artsci/acrp/>) can sometimes have missed quizzes or assignments pro-rated. Note, the self-declaration of absence due to extenuating circumstances can be used for absences up to 48 hours and are automatically approved. Accommodation for longer absences can be requested through the same system, but will require supporting documentation. All requests for any adjustment of deadlines or pro-rating of marks must be submitted via the above-linked system **prior to missing the deadline or quiz.**

Assignments must be submitted by the posted deadlines, barring any **PRIOR** arrangements made with the instructor, following submission of a declaration via the university Academic Consideration Request system (link above). Absent such arrangements, late work will not be accepted.

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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 Queen's Student Accessibility Services (QSAS) and register as early as possible. For more information, including important deadlines, please visit the QSAS website at:

<https://www.queensu.ca/studentwellness/accessibility-services>