
Sex and Evolution

BIOL 369 Winter 2023

CALENDAR DESCRIPTION

Why sex? The evolutionary origins and consequences of sex and sexual reproduction. Topics include costs and benefits of sexual reproduction, the evolution and coevolution of sexes, gametes and genitalia, mating systems, gender differences and sex determination throughout the biotic world.

SCHEDULE & CONTACT INFORMATION

Lectures: Mon 8:30 / Wed 10:30 / Thu 9:30

Location: Kingston 201

Tutorials: please see your individual schedule.

Instructor	Dr. Adam Chippindale
Instructor Contact	adam.chippindale@queensu.ca ; (613) 533 6139
Office Hours	TBA BioSci 2420
TAs:	TBA
TA Office Hours	Please contact your TA.

Learning Objectives

As instructors our goals are firstly to engage you in the study of evolution and genetics using reproductive biology as a matrix. As second and third major goals, we 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, we ask you to translate scientific research from original published papers into lay terms as a popular article, allowing creativity whilst sharpening understanding. 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 paradoxical nature of sexual reproduction and the challenge explaining its evolutionary origins and advantages.
- An appreciation of the extraordinary diversity of reproductive systems and how they influence organismal behaviour.
- Improved research, writing and presentation skills.
- A ridiculous number of weird biology factoids to relate to friends and family members.

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	3	12	36
	Seminar			
	Laboratory			
	Tutorial	1	8	8
	Practicum			
	Group learning			
Other	Individual instruction			
	Online activity	3	6	18
	Off-campus activity			
	Private study	5	12	60
Total hours on task				122

Course Outline: Main Topics

- Evolutionary origins of recombination.
- The costs of sexual reproduction: males, gene-sharing, STIs and more.
- The origin of mating types, separate sexes, and gender.
- Sex chromosomes and other genomic consequences of sexes.
- Sex-linked genetic and epigenetic diseases.
- Mating systems and strategies.
- Sexual selection: intrasexual competition and mate choice.
- Sexual selection: implications for speciation and rates of evolution.
- Intersexual conflict: the evolutionary battle of the sexes.
- Parent-offspring conflict and genomic imprinting.

Textbooks/Readings

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

Grading Scheme

Component	Weight	Dates
Exams (10% midterm, 25% final)	35%	TBD
Online Quizzes	10%	TBD
Major Paper (5% proposal, 20% paper)	25%	TBD
Tutorial Exercises & Participation	30%	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., mini-reviews, 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/>