

**DEPARTMENT OF BIOLOGY
UNIVERSITY OF TORONTO MISSISSAUGA**

**BIO342H5S LEC9101
Evolutionary Biology
Course Outline - Winter 2021**

Class Location & Time	Mon, 01:00 PM - 02:00 PM Wed, 01:00 PM - 03:00 PM
Instructor	Ruth Rivkin
Office Location	DV2020
Office Hours	Mon and Wed 2:00-3:00 PM via Zoom
E-mail Address	lr.rivkin@mail.utoronto.ca
Course Web Site	https://q.utoronto.ca
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Course Description

An introduction to the concepts and importance of evolutionary biology. The course will focus on how genetic variation arises and is maintained, mechanisms of evolutionary change and how these mechanisms lead to adaptation, sexual selection, speciation and co-evolution. Throughout the course we will consider how fossils, experiments, genetics and molecular systematics can be used to understand evolution. [36L, 12T]

Prerequisite: BIO207H5

Recommended: (BIO360H5 or STA215H5) (strongly recommended) (SCI)

Distribution Requirement: SCI

The UTM Calendar states that students who lack the prerequisites for a course can be deregistered at any time

Objectives

The goal of BIO342 is to provide students with a focused introduction to evolutionary biology, including the key concepts, mathematical foundations, and its importance to modern science and society.

Students will achieve the following outcomes by the conclusion of the course:

1. Understand the fundamental concepts in evolutionary biology and the impact of evolution on the natural world.
2. Identify patterns of evolution using mathematical solutions
3. Understand how heritability, natural selection and an evolutionary response are estimated using data collected from natural populations.
4. Critically read and evaluate scientific papers.

Required Textbook and Materials

Evolutionary Analysis - *Scott Freeman and Jon C. Herron*

Edition: Fifth

ISBN:0-13-227584-8

Purchasing the book: Hard Copies and unbound textbooks are available in the Bookstore. You can purchase a digital copy of the book from the UofT Bookstore. Access to the e-text is valid for 6 months.

The library has also added a single copy of this book to their reserve materials.

- *Required readings are available in the book.*

- Articles will also be assigned for reading in class and available on the course website

Assessment and Grading Policies

Type	Description	Due Date	Weight	
Quiz	Quizzes on assigned readings of peer-reviewed articles	On-going	20%	
Other	Summaries of assigned readings of peer-reviewed articles	On-going	5%	
Class Participation	Online quizzes and activities based on course content	On-going	5%	
Assignment	Worksheets and class data analysis	On-going	15%	
Term Test	Term-test 1	2021-02-08	15%	
Term Test	Term-test 2	2021-03-22	15%	
Final Exam	Cumulative	TBA	25%	
			Total	100%

Notes on Assessment Items

Quizzes - 20%

Five quizzes related to assigned readings of peer-reviewed articles. Your four "best" quizzes will be recorded towards your grade.

Paper summaries - 5%

Written summaries of the assigned readings of peer-reviewed articles. Worth 1% each, these are designed to help you prepare for the paper quizzes

Class participation - 5%

Participation in online lecture-based questions and activities, beginning the first week of class.

Assignments - 15%

Exam preparation assignments (2) and lab assignment (1) using class-collected data from the UTM old field. Worth 5% each

Term-test 1 - 15%

Students will be responsible for all lecture material in classes 1-8 and required readings from the textbook. Required readings from peer-reviewed articles will not be covered on the test. **Date: February 8.**

Term-test 2 - 15%

Students will be responsible for all lecture material in classes 9-16 and required readings from the textbook. Required readings from peer-reviewed articles will not be covered on the test. **Date: March 22.**

Final exam - 25%

Students will be responsible for all lecture and required reading material presented during the course, except for readings from peer-reviewed articles which will not be covered on the final exam.

Teaching Methods and Academic Supports

This course will be administered entirely online via Quercus.

Lectures: Lectures will be delivered synchronously during the scheduled class time (Mon and Wed 1:00-2:00 PM) Office hours will take place immediately following class time (Mon and Wed 2:00-3:00 PM). You are strongly encouraged to attend. You are also expected to complete all assignments, tests, and exams by their assigned date.

Lectures will cover core concepts in the course, and some elements from the assigned textbook readings. Lectures will go beyond material presented in the book through further explanation and practical examples. You are responsible for material from both the

lectures and textbook. Lectures will be recorded posted on Quercus for students to re-watch at their convenience.

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session. Course videos and materials belong to your instructor, the university, and/or other sources depending on the specific facts of each situation, and are protected by copyright. Do not download, copy, or share any course or student materials or videos without the explicit permission of the instructor. For questions about recording and use of videos in which you appear please contact your instructor.

Readings: Reading material will be included on the midterm and final exam. Required readings from peer-reviewed articles will not be covered on the term tests and final exam.

Tutorials: Tutorials will take the form of weekly drop-in help sessions with your TA. TAs will review assignment material and paper readings if requested by students.

Procedures and Rules

E-Mail Policy

The University's official method of correspondence with students is through their University of Toronto e-mail accounts. It is the student's responsibility to keep his/her @mail.utoronto.ca account active and check it on a regular basis.

All e-mails from students must include your full name and student number as well as have the course code in the subject line.

Re-Mark Policy

Requests for re-evaluation of course work must be made in writing to the instructor no later than one month following the return of the work. Re-evaluation may result in a grade increase, decrease, or no change.

For questions on course assignments, quizzes, and readings, please contact your tutorial TA via email. For questions on course material, exams, and urgent matters (e.g. illness, bereavement), contact your instructor directly.

Please allow for at least three business days for a response before making further inquiry

Religious Observance

Information about the University's Policy on Scheduling of Classes and Examinations and Other Accommodations for Religious Observances is at <http://www.vicereprovoststudents.utoronto.ca/publicationsandpolicies/guidelines/religiousobservances.htm>

Classroom Management

Although this course will be administered online, students are expected to participate in classroom activities. Small quizzes and activities will be posted most Mondays and Wednesdays this semester. This will encourage students to remain up to date on the viewing of the recorded lectures.

Late Assignments, Extensions and Missed Term Tests

You are expected to complete and submit all assignments on time.

The University is temporarily suspending the need for a doctor's note or medical certificate for absences from academic participation (<https://www.vicereprovoststudents.utoronto.ca/covid-19/>). Please use the Absence Declaration tool on ACORN to declare an absence if you require consideration for missed academic work. You are responsible for contacting your instructors to request the academic consideration you are seeking. Record each day of your absence as soon as it begins, up until the day before you return to classes or other academic activities.

Late Policy: Late or missing class participation and quizzes activities will receive a mark of zero. Late assignments are penalized at 10% per day. After 5 days (weekends included; late penalty of 50%) assignments will not be accepted and a mark of zero will be assigned.

Missed Term Test: If you miss a term test:

1. Declare your absence on ACORN.
2. Contact your instructor via email within 48 hours of the missed evaluation. Submit an explanation detailing the University-approved circumstances, beyond your control, that caused you to miss the test or assignment.
3. Missed term tests with a valid explanation will have its weight shifted to the final exam.

Note that holidays and pre-purchased plane tickets, family plans (unless related to death of an immediate family member), conflicting class schedules/tests/work and lack of preparation are not acceptable excuses.

Missed Quiz: If you miss one quiz, that quiz will receive a zero because only four out of five quizzes will be counted. If you miss a second quiz, the grade for that quiz will be redistributed to the other three quizzes.

If an appeal is accepted the grades for missed tests/exams will be redistributed to the final exam. Reweighting both term tests to the final exam is done at the students peril. Accepted appeals for missed quizzes will be distributed to the remaining quizzes. **No more than 30% of course material will be re-weighted.**

Extensions: Extensions on assignments will only be granted if illness or injury precludes you from completing work for the entirety of the assignment availability (i.e. from date assigned to due date). Students unable to meet assignment deadlines must email the instructor at least 24 hours prior to the assignment deadline; extensions will be granted at the discretion of the instructor.

The written explanation that you submit represents an appeal from you, requesting the opportunity to make up that portion of your grade in some other manner. If an appeal is not received, or if the appeal is deemed unacceptable, you will receive a grade of zero for the item you missed. If the appeal is granted - that is, your reason for missing the test is considered acceptable - then a mechanism for reweighting the missed item will be offered.

Students who enrol in courses with conflicting lectures, tutorials or practicals will not receive accommodations for conflicting exams, assignments, lecture material, in-class participation, etc.

Missed Final Exam

Students who cannot complete their final examination due to illness or other serious causes must file an [online petition within 72 hours of the missed examination](#). Late petitions will **NOT** be considered. Students must also record their absence on ACORN on the day of the missed exam or by the day after at the latest. Upon approval of a deferred exam request, a non-refundable fee of \$70 is required for each examination approved.

Academic Integrity

The code of Behaviour on Academic Matters states that:

The University and its members have a responsibility to ensure that a climate that might encourage, or conditions that might enable, cheating, misrepresentation or unfairness not be tolerated. To this end all must acknowledge that seeking credit or other advantages by fraud or misrepresentation, or seeking to disadvantage others by disruptive behaviour is unacceptable, as is any dishonesty or unfairness in dealing with the work or record of a student.

- University of Toronto Mississauga Academic Calendar

It is your responsibility as a student at the University of Toronto, to familiarize yourself with, and adhere to, both the Code of Student Conduct and the Code of Behaviour on Academic Matters.

This means, first and foremost, that you should read them carefully.

- The [Code of Student Conduct](#) is available from the U of T Mississauga website (Registrar > Academic Calendar > Codes and Policies) or in your print version of the Academic Calendar.
- The [Code of Behaviour](#) on Academic Matters is available from the U of T Mississauga website (Registrar > Academic Calendar > Codes and Policies) or in your print version of the Academic Calendar.
- Another helpful document that you should read is [How Not To Plagiarize](#) by M. Proctor.

With regard to remote learning and online courses, UTM wishes to remind students that they are expected to adhere to the Code of Behaviour on Academic Matters regardless of the course delivery method. By offering students the opportunity to learn remotely, UTM expects that students will maintain the same academic honesty and integrity that they would in a classroom setting. Potential academic offences in a digital context include, but are not limited to:

1. Accessing unauthorized resources (search engines, chat rooms, Reddit, etc.) for assessments.
2. Using technological aids (e.g. software) beyond what is listed as permitted in an assessment.
3. Posting tests, essays, or exam questions to message boards or social media.
4. Creating, accessing, and sharing assessment questions and answers in virtual "course groups".
5. Working collaboratively, in-person or online, with others on assessments that are expected to be completed individually.

Other Resources

AccessAbility

The University accommodates students with disabilities who have registered with the AccessAbility Resource Centre. Please let me know in advance, preferable in the first week of class, if you will require any accommodation on these grounds. To schedule a registration appointment with a disability advisor, please call the centre at 905-569-4699 or e-mail at: access.utm@utoronto.ca. <http://www.utm.utoronto.ca/access/>

Robert Gillespie Academic Skills Centre

Students can visit the Academic Skills Centre to consult with one of its strategists about understanding learning style, developing study plans for upcoming tests/exams, or discussing papers. Special Diagnostic Assessments are also offered and are designed to help you learn exactly where you stand with respect to critical academic skills.

<http://www.utm.utoronto.ca/asc>

UTM Library (Hazel McCallion Academic Learning Centre)

The University of Toronto boasts the biggest academic library in Canada and the second biggest in North America. Various services are available to students at the UTM Library and across the UofT library system. Services including borrowing, interlibrary loans, online references, laptop loans and the RBC Learning Commons. For more information, visit <http://library.utm.utoronto.ca>.

Course Schedule

Week	Class/Tutorial	Date	Topic	Required Reading
Week 1	1	Monday, January 11, 2021	Evidence for evolution and origins of life	pp 62-66, Computing Consequences 2.1
	2	Wednesday, January 13, 2021	Genetic and phenotypic variation I	Computing Consequences: 3.1, 5.2, 6.1, 6.2, 6.4
Week 2	3	Monday, January 18, 2021	Genetic and phenotypic variation II	6.1; Computing Consequences: 9.2
	4	Wednesday, January 20, 2021	Natural selection I	Section 6.3 (pp 201-206); Computing Consequences: 6.3, 6.6
	Paper 1	Friday, January 22, 2021	Tinghitella et al 2018, Am Nat	
Week 3	5	Monday, January 25, 2021	Natural selection II	Computing Consequences 9.3
	6	Wednesday, January 27, 2021	Mutation	Section 6.4 (pp 216-221), Computing Consequences: 6.8, 7.1, 7.2
	Paper 2	Friday, January 29, 2021	Villa et al 2019, PNAS	
Week 4	7	Monday, February 1, 2021	Dispersal and Non-random mating	Computing Consequences: 7.3, 7.4
	8	Wednesday, February 3, 2021	Genetic drift	Computing Consequence: 6.7, 6.9
	Assignment	Friday, February 5, 2021	Calculations exercise 1	
Week 5		Monday, February 8, 2021	Term Test 1	1-2pm; material from lectures 1-8
	9	Wednesday, February 10, 2021	Maintenance of genetic variation I	
		February 16-19, 2021	Reading Week	
Week 6	10	Monday, February 22, 2021	Maintenance of genetic variation II	
	11	Wednesday, February 24, 2021	Sex and evolution I	
	Paper 3	Friday, February 26, 2021	Grant and Grant 1995, Evolution	
Week 7	12	Monday, March 1, 2021	Sex and evolution II	
	13	Wednesday, March 3, 2021	Sex and evolution III	
	Assignment	Friday, March 5, 2021	Field lab assignment	
Week 8	14	Monday, March 8, 2021	Speciation-I	
	15	Wednesday, March 10, 2021	Speciation II	
	Paper 4	Friday, March 12, 2021	Rabosky et al 2018, Nature	
Week 9	16	Monday, March 15, 2021	Coevolution	
	17	Wednesday, March 17, 2021	Paleontology and macroevolution	Sect. 18.1
	Assignment	Friday, March 19, 2021	Calculations exercise 2	

Week 10		Monday, March 22, 2021	Term Test 2	1-2pm; material from lectures 9-16
	18	Wednesday, March 24, 2021	Phylogenetics	Ch. 4.3
	Paper 5	Friday, March 26, 2021	Hollister et al 2015, Mol Biol Evol	
Week 11	19	Monday, March 29, 2021	Molecular evolution	Sect. 7.3
	20	Wednesday, March 31, 2021	Human evolution I	
Week 12	21	Monday, April 5, 2021	Human evolution II	
	22	Wednesday, April 7, 2021	Application of evolutionary biology	

Last Date to drop course from Academic Record and GPA is March 15, 2021.

Every attempt will be made to follow this syllabus, but its content are subject to change, according to the rules as outlined in the UTM Instructor's Handbook, section 3.2.2.