



COURSE OUTLINE

1. **Course:** BIOL 401, Evolutionary Biology - Winter 2021

Lecture 01: MWF 10:00 - 10:50 - Online

Instructor	Email	Phone	Office	Hours
Dr Mindi Summers	mindy.summers@ucalgary.ca	403 220-8761	BI 041	TBA
Dr Samuel Yeaman	samuel.yeaman@ucalgary.ca	403 220-6126	BI 294	Monday 11:30am-12pm by Zoom: through the D2L link

Online Delivery Details:

This course is being offered online in real-time via scheduled meeting times, you are required to be online at the same time.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

Lectures will be given synchronously M, W, F from 10-11am via Zoom.

Tutorials will be given synchronously on Wednesdays via Zoom.

Links for zoom will be posted to D2L the week before commencement of classes.

Course Site:

D2L: BIOL 401 L01-(Winter 2021)-Evolutionary Biology

Note: Students must use their U of C account for all course correspondence.

2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

Prerequisite(s):

Biology 313 and 315.

3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Component(s)	Weighting %	Date
In-class quiz (4)	10% * 4 = 40%	Jan 29, Feb 26, Mar 19, Apr 14
Tutorial assignments	4.5% * 8 = 36%	see schedule
Surveys	1%	Jan 15, Apr 14
Final presentation (in tutorials)	11%	Mar 31, Apr 7
Reading assignments (Beak of the Finch)	4% * 3	Feb 5, Mar 5, Mar 26

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	96 %	90 %	85 %	80%	75%	70 %	65 %	60%	55%	53 %	50 %

4. Missed Components Of Term Work:

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

5. Scheduled Out-of-Class Activities:

There are no scheduled out of class activities for this course.

6. Course Materials:

Required Textbook(s):

Jonathan Weiner, *The beak of the finch: a story of evolution in our time* Vintage.

Recommended Textbook(s):

Bergstrom and Dugatkin, *Evolution*: Norton.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

7. Examination Policy:

Four in-class quizzes will be given synchronously in place of the usual exams (each worth 10%). These will be open book, in that it is acceptable to consult passive sources of knowledge (class notes, internet searches, etc.), but they are to be completed independently: you are specifically prohibited from working with or contacting any other individuals while you complete the exam (no active communication with anyone via any means). Violation of these rules is considered academic misconduct with penalties as described in the University Calendar section K.

IMPORTANT: It is the student's responsibility to ensure that they have adequate computer and internet access to write the quizzes. Students will be required to begin their quiz promptly at the start of their scheduled class on the day of the quizzes. If a student encounters any technical issues in starting an quiz, they **MUST** document the issue by taking a photo, screenshot, or video, and they must contact the instructor immediately so that either additional time can be provided to access the quiz or alternative arrangements made. **Students claiming such difficulties who do not contact their instructor providing evidence of technical difficulties within 15 minutes of the scheduled start of the quiz will not be allowed to write the quiz and will receive a grade of zero (0) on the exam.** If a student's quiz is suspended during the quiz (lost internet connection, internet browser crashes etc.), they **MUST** provide evidence as outlined above and contact the instructor immediately. Students will then be granted re-entry to suspended quiz if they began the quiz on time, provided evidence of the suspension, and still have time remaining to complete their quiz.

Each quiz will begin at the start of class and take 30 minutes, with remaining part of lecture time available as buffer.

Students should also read the Calendar, [Section G](#), on Examinations.

8. **Approved Mandatory And Optional Course Supplemental Fees:**

There are no mandatory or optional course supplemental fees for this course.

9. **Writing Across The Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

10. **Human & Living Organism Studies Statements:**

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

STUDIES IN THE BIOLOGICAL SCIENCES INVOLVE THE USE OF LIVING AND DEAD ORGANISMS. Students taking laboratory and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Undergraduate Program Director of the Department.

Students are expected to be familiar with [Section SC.4.1](#) of the University Calendar.

11. **Reappraisal Of Grades:**

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

12. **Other Important Information For Students:**

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Services:** For more information, see www.ucalgary.ca/wellnesscentre or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email (svsa@ucalgary.ca) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>)
- d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act

with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)
Student Academic Misconduct [Policy](#) and [Procedure](#)
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

- e. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head, Undergraduate of the Department of Biological Sciences, Heather Addy by email addy@ucalgary.ca or phone 403 220-6979. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.

- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.

- g. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: sciencerep@su.ucalgary.ca. [Student Ombudsman](#), Email: ombuds@ucalgary.ca.

- h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

- i. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

COURSE OVERVIEW

Instructors

Dr. Sam Yeaman Phone: 403-220-6126 Email: samuel.yeaman@ucalgary.ca

Dr. Mindi Summers Phone: 403-220-8761 Email: mindi.summers@ucalgary.ca

Graduate Teaching Assistants (GTAs)

Kevin Duclos kevin.duclos@ucalgary.ca

Email policy

Email is the preferred method of communication for questions and ideas. We will do our best to read and respond to emails within 24 hours Monday-Friday. We will try to respond to emails received during the weekend by the following Tuesday. To ensure targeted and timely response, please include the following components in all emails: a) appropriate salutation (e.g., “Dear Dr. Yeaman/Summers”); b) description of the problem/question; c) description of the steps you have taken to solve the problem/answer the question; and d) specific feedback that you are requesting.

Office hours

Students are invited to discuss the assignments, lecture, tutorial, and other evolution-related topics during office hours held remotely on Zoom. We also welcome discussion immediately after lecture on Monday, Wednesday, and Friday, and by appointment.

Course D2L site

The D2L website will have the most updated schedule, assignments, readings, and slides and materials. You will also use D2L to complete and turn-in your assignments.

Required and recommended texts

Required reading: *The beak of the finch: a story of evolution in our time*; Jonathan Weiner; ISBN: 9780679733379

Recommended: *Evolution*; Bergstrom and Dugatkin

Class representatives

Please volunteer to be a class representative! Class reps are currently enrolled students in Biology 401 who volunteer to collect and share student feedback on Biology 401 – you can attend any meetings at any time (no commitment is required). Class reps meet with us on Mondays after class for approximately 30 minutes (we always bring snacks!). During our weekly meeting, class reps first share out ideas and comments from students and then we discuss ways to improve the course. Class reps will also lead collection and analysis of mid-semester feedback on the course. You will hear updates from the class reps weekly – please take the time to talk with them so that your experiences and ideas are heard!

Additional resources to learn about evolution

1) Web of Science and Google Scholar are excellent search engines to find primary articles in evolution.

2) *Understanding evolution* (http://evolution.berkeley.edu/evolibrary/article/evo_01)

3) *Evolution: the story of life on earth*; Jay Hosler; ISBN: 9780809043118

4) Other textbooks on evolution include:

Evolution: Making sense of life. Zimmer and Emlen

Evolution. Futuyma.

Evolutionary analysis. Herron and Freeman.

LEARNING OUTCOMES & ASSESSMENT

Course themes

Microevolutionary change within populations and macroevolutionary change over vast periods of time have contributed to and shaped the diversity of life on our planet. To develop evolutionary thinking across timescales, this course will explore three key themes:

- 1) Mutation, recombination, natural selection, genetic drift, and gene flow generate, retain, and eliminate genetic diversity in populations over relatively short timeframes.
- 2) All organisms share common ancestry. Phylogenetic thinking allows investigation of the relationships among organisms.
- 3) The history of life on earth is dynamic and has played out over at least the past 3.5 billion years, with evolutionary innovations and rates of speciation and extinction varying through time.

Course learning outcomes

By the end of this course, you will be able to:

1. Demonstrate a thorough understanding of the process and pattern of evolutionary change.
2. Use an evolutionary framework and reasoning to applied and novel scenarios.
3. Interpret and use common qualitative and quantitative evolutionary models (e.g., phylogenetic trees).
4. Find, analyze, interpret, and discuss primary and popular literature on topics in evolutionary biology.
5. Communicate opinions on current topics in evolutionary biology orally in small discussions and presentations

Active-learning in lecture

In the lecture section of this course, you will be working with neighbors to discuss and solve problems. Typically, this will entail first solving problems as individuals, then the group will engage in peer-instruction and collaboration to answer questions, solve problems, and develop learning strategies – a technique that has been shown to increase learning compared to instructor lecture and explanation only (see Smith et al., 2011).

Beak of the Finch reading assignments

We will read and discuss the *Beak of the Finch*, a nonfiction book that describes the groundbreaking research of Peter and Rosemary Grant. To accompany our reading of *Beak of the Finch*, we will also be reading a set of primary articles that resulted from the work described in the book. An overview of the *Beak of the Finch* assignments is posted on D2L.

Tutorial assignments

You will complete eight tutorial assignments during and following tutorial sessions. Assignments are due **at the beginning** of the next week's tutorial. You can only submit an assignment if you were at the tutorial it is based on.

Tutorial presentations

You will work with a partner to read, annotate, and present one paper on evolution. A list of papers to choose from will be provided, and you will need to choose your paper and partner during the tutorial session on February 24th. Presentations will occur on during your tutorial in the last two weeks of the semester.

Surveys

There will be surveys announced throughout the course that will be available on D2L. These surveys will be marked for completion only, but you must complete ALL surveys to receive credit. These surveys are designed to improve instruction in this course and your effort on these surveys is important. You are asked to not use outside resources when completing these surveys. Since the timing of the surveys is important, there will not be opportunities for late submissions once each survey has closed.

Week	Lecture Topic	Tutorial Topic	Synchronous Activities <i>Estimated time: 4 hours/week</i>	Assignments & Due Dates [^] <i>Estimated time: 4 hours/week</i>
1 Jan 11-15	M: Course introduction W: History of Evolutionary thought F: Hardy-Weinberg review	Introduction	M/W/F: Lecture (10:00-10:50) W: Tutorial (Scheduled)	Fri: Survey 1
2 Jan 18-22	M: Two-locus inheritance W: Genetic drift F: Genetic drift	1: Hardy-Weinberg	M/W/F: Lecture (10:00-10:50) W: Tutorial (Scheduled)	
3 Jan 25-29	M: Population subdivision W: Population subdivision <u>F: Quiz</u>	2: Genetic Drift	M/W: Lecture (10:00-10:50) F: Quiz (10:00-10:50) W: Tutorial (Scheduled)	W: Tutorial Assignment 1 (before class)
4 Feb 1-5	M: Quantitative genetics W: Selection on the phenotype <u>F: Beak of the Finch I</u>	3: Drift & Gene Flow	M/W: Lecture (10:00-10:50) F: Discussion (10:00-10:50) W: Tutorial (Scheduled)	W: Tutorial Assignment 2 (before class) F: Beak of the Finch I (by 09:59)
5 Feb 8-12	M: Single-locus selection W: Drift vs. selection F: Drift vs. Selection	4: Selection	M/W/F: Lecture (10:00-10:50) W: Tutorial (Scheduled)	W: Tutorial Assignment 3 (before class)
Winter Break				
6 Feb 22-26	M: Adaptation W: Review <u>F: Quiz</u>	5: Review	M/W: Lecture (10:00-10:50) F: Quiz (10:00-10:50) W: Tutorial (Scheduled)	W: Tutorial Assignment 4 (before class)
7 Mar 1-5	M: Fossils & geologic evidence W: History of life on earth <u>F: Beak of the Finch II</u>	6: Diversity	M/W: Lecture (10:00-10:50) F: Discussion (10:00-10:50) W: Tutorial (Scheduled)	F: Beak of the Finch II (by 09:59)

8 Mar 8-12	M: Species W: Speciation F: Extinction	7: Species	M/W/F: Lecture (10:00-10:50) W: Tutorial (Scheduled)	W: Tutorial Assignment 6 (before class)
9 Mar 15-19	M: Evolutionary trees I W: Tree-thinking F: Quiz	8: Phylogenetics I	M/W: Lecture (10:00-10:50) F: Quiz (10:00-10:50) W: Tutorial (Scheduled)	W: Tutorial Assignment 7 (before class)
10 Mar 22-26	M: Phylogenetic inference W: Symbiosis F: <u>Beak of the Finch III</u>	9: Phylogenetics II	M/W: Lecture (10:00-10:50) F: Discussion (10:00-10:50) W: Tutorial (Scheduled)	W: Tutorial Assignment 8 (before class) F: Beak of the Finch III (by 09:59)
11 Mar 29-Apr 1	M: Coevolution W: Sexual selection	Presentations	M/W: Lecture (10:00-10:50) W: Tutorial (Scheduled)	W: Tutorial Assignment 9 (before class)
12 Apr 6-9	W: Human evolution F: Personal sequencing	Presentations	W/F: Lecture (10:00-10:50) W: Tutorial (Scheduled)	M: Tutorial Presentation (by 23:59)
13 Apr 12-16	M: Conservation W: <u>Quiz</u>	No tutorial	M: Lecture (10:00-10:50) W: Quiz (10:00-10:50)	W: Survey (by 23:59)

Course Outcomes:

- Evaluate and explain the main points of peer-reviewed evolutionary biology articles
- Communicate opinions on current topics in evolutionary biology orally in small discussions and presentations
- Analyze the differences and complementarities of micro-and macroevolution
- Critique the soundness of arguments made about evolution made in social media, the news, etc.
- Explain how the main evolutionary processes interact to shape patterns of biological diversity

Electronically Approved - Jan 08 2021 13:40

Department Approval

Electronically Approved - Jan 10 2021 09:19

Associate Dean's Approval