



BIOL*2400 Evolution

Winter 2023

Section(s): 01

Department of Integrative Biology

Credit Weight: 0.50

Version 1.00 - January 06, 2023

1 Course Details

1.1 Calendar Description

This course provides a broad overview of evolutionary biology. It examines the concepts and mechanisms that explain evolutionary change and the evolution of biological diversity at different levels of biological organization (gene to ecosystem) and across space and time. It also introduces historical forms of scientific inquiry, unique to biology. The course is designed to be of interest to students with general interests in science and in research in all areas of biology.

Pre-Requisites: BIOL*1070, BIOL*1090

1.2 Course Description

This course will be delivered in a face-to-face format in Winter 2023.

1.3 Timetable

Lectures: Most of the course content will be delivered in on-campus lectures on Monday, Wednesday and Friday, as well as assigned readings.

Tutorial sessions: You will be scheduled into a Friday tutorial section. Five sessions are scheduled in weeks 2, 4, 8, 10, 11.

1.4 Final Exam

Final exam will take place during the regular examination period. Time, location and format are subject to change.

2 Instructional Support

2.1 Instructional Support Team

Instructor:	Professor Jinzhong Fu
Email:	jfu@uoguelph.ca
Telephone:	+1-519-824-4120 x52715
Office:	SC1 1458
Office Hours:	by appointment

3 Learning Resources

3.1 Required Resources

Lecture (Readings)

The purposes of lectures are to motivate interest and curiosity in the topic of evolution while supporting students in their learning of fundamental topics, concepts and methods in evolutionary biology. Students are strongly encouraged to supplement their learning of particular concepts taught in class through readings from the course textbook and the primary literature as indicated by the instructor. Students will be advised in advance if they are expected to complete any readings prior to lecture.

Courselink (Website)

<https://courselink.uoguelph.ca>

Most course materials will be posted here. The Courselink site will be used: for instructions and hints on the Term Assignment, to ask the Professor about course material, to ask the Course Coordinator about logistics, to communicate with the class on class Discussion forums about new discoveries in Evolutionary Biology and to communicate with the other students in your tutorial group in your private group Discussion topic.

Tutorial Assignments, Worksheets, and Discussions (Other)

The purpose of the tutorials is to engage your participation in solving evolutionary problems with your colleagues. Teaching assistants will support your completion of group assignments and exam preparation. They will assist you in developing study skills and help improve your scientific writing. You may find that discussion of course concepts outside of tutorial with your group members enhances your learning and overall experience in BIOL2400.

3.2 Recommended Resources

Readings (Textbook)

Two textbooks are used for the course:

Evolution: Making Sense of Life (3rd edition) by D. Emlen and C. Zimmer

Evolutionary Analysis (5th edition) by J.C Herron and S. Freeman

There are recommended, not required.

3.3 Campus Resources

The Academic Calendar is the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs:

<https://www.uoguelph.ca/registrar/calendars/undergraduate>

If you are concerned about any aspect of your academic program:

- make an appointment with a program counsellor in your degree program.
<http://www.bsc.uoguelph.ca/index.shtml> or
<https://www.uoguelph.ca/uaic/programcounsellors>

If you are struggling to succeed academically:

- There are numerous academic resources offered by the Learning Commons including, the Writing Centre, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist.
<http://www.learningcommons.uoguelph.ca/>

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance.
<https://www.uoguelph.ca/counselling/>
- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations.
<http://www.uoguelph.ca/~ksomers/>

If you have a documented disability or think you may have a disability:

- The Student Accessibility Services (SAS) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability. For more information, including how to register with the centre please see: <https://www.uoguelph.ca/sas/>
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4 Learning Outcomes

4.1 Learning Outcomes

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

1. Conceptual Skill - Differentiate Darwin's original theory from evolutionary theory after the "Modern Synthesis".
 2. Conceptual Skill - Accurately define and describe terms and concepts such as evolution, adaptation and fitness.
 3. Conceptual Skill - Explain simple methods of phylogenetic tree estimation and interpretation.
 4. Conceptual Skill - Explain basic mechanisms of evolutionary change at the genetic, molecular and phenotypic levels such as natural selection, genetic drift, mutation and gene flow.
 5. Conceptual Skill - Identify, differentiate, analyze and give examples of processes such as sexual selection, multi-level selection, and life-history evolution.
 6. Conceptual Skill - Identify species concepts and explain common mechanisms of speciation.
 7. Inquiry Skill - Construct a phylogenetic tree using the cladistic approach and apply the comparative method to explain character evolution.
 8. Inquiry Skill - Elementary practice with model building and hypothesis testing.
 9. Basic Skill - Comprehend scientific and summarize scientific material on Evolution.
 10. Basic Skill - Acquisition, filtering, and synthesis of scientific concepts, facts and methods.
 11. Basic Skill - Applied numeracy.
 12. Basic Skill - Communicate scientific ideas about evolution.
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5 Teaching and Learning Activities

5.1 Lecture

Topics:	Topic
	1 History of Evolutionary Thought
	2 Phylogenetics and Tree Building
	3 Population Genetics: Drift, Migration and Natural Selection
	4 Quantitative Genetics
	5 Adaptation
	6 The Evolution of Sex and Sexual Selection
	7 The Evolution of Social Behaviour
	8 Life History Evolution
	9 Species and Speciation
	10 Origin of Life
	11 Diversification and Extinction: Macroevolution
	12 Human Evolution

5.2 Tutorial Review Sessions

Teaching assistants will run tutorial help sessions to assist students with course material and the assignments. Five sessions are scheduled on Friday of weeks 2, 4, 8, 10, 11.

5.3 Note

5.4 Important Dates

Date	Activity
Jan 9	First Class
Jan 20	Tutorial 1; Students assigned to groups for Group Assignment
Jan 23	quiz 1
Feb 3	Tutorial 2

Feb 10	Group Assignment due
Feb 16	quiz 2
Mar 10	Tutorial 3
Mar 13	Quiz 3
Mar 24	Tutorial 4
Mar 31	Tutorial 5
April 5	Quiz 4
Apr 6	Last day of class
Apr 13-25	Final Exam period

6 Assessments

6.1 Marking Schemes & Distributions

Name	%
Group assignment	15
quizzes (x3)	45
Final	40
Total	100

Note: 2 bonus marks for discussion participation.

6.2 Assessment Details

Group assignment (15%)

Due: Fri, Feb 10, 10:00 PM
Submit to Dropbox

Learning Outcome(s) Addressed: 3,4,7,8,11,12

quizea 1-4 (45%)

Date: Mon, Jan 23 - Thu, Apr 6, Online

Note: Best three of the four quizzes. 15% each.

Course Content/Activity: Lecture, readings, group assignment

Learning Outcome(s): 1,2,3,4,7,8,10,11,12

Final Exam (40%)

Time and location: to be determined

Course Content/Activity: All lectures from the beginning of the course, reading & Group Assignment

Learning Outcome(s) : 1,2,3,4,5,6,7,8,9,11

6.3 Note

Group Assignment

- Students will be expected to work in groups of 3 assigned through Courselink. All group members will have been scheduled into the same tutorial section to facilitate group interaction. A tutorial has been scheduled for help with the assignment.
- The Assignment will involve reflection, discussion and calculation on the topics of Phylogenetic Reconstruction and Population Genetics. The Assignment will be based on lecture material.
- The Assignment will be posted on Courselink at least two weeks prior to the due date.
- The Assignment (one document submitted per group) must be uploaded to Dropbox on Courselink by 10:00 pm on the due date. Assignments must be submitted in .doc or .docx format. The penalty for late submission will be 25% of the total assignment value per day. Please note that Turnitin will be used (see below).
- We recommend that all communication among group members be done in your group's private Discussion topic on Courselink.

Online quizzes

- A total of four 30-minute online quizzes. The best three will be counted toward the final grade.
- The quizzes will include material covered in lecture to that point and in the group project.
- Tutorials have been scheduled before each quiz.
- The quizzes will consist of multiple choice questions. Some calculation may be required.
- All quizzes are open-book.

Final Exam

- The final exam will take place during the regular examination period.
- The final exam will consist of 1 essay question and 4-6 short-answer questions. The essay question will be from the practice essay questions.
- It will be cumulative and require a deep synthetic understanding of all the concepts covered in the course.

Practice essay questions for final exam

During the semester, three practice short-essay questions will be handed out. Students are encouraged to submit their essay online. Feedback will be provided to at least one submission by an instructor or a GTA. One of the 3 practice questions will be on the final exam.

For all online submissions (including the group assignment report), we will be using Turnitin, integrated with the CourseLink Dropbox tool, to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to maintain academic integrity at the University of Guelph.

Participation of class discussion

Students are encouraged to participate in class discussion on the discussion board. Maximum 2 bonus marks will be offered to students who frequently participate discussion with insightful thoughts.

7 Department of Integrative Biology Statements

7.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. [B.Sc. Academic Advising](#) or [Program Counsellors](#)

7.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. <http://www.learningcommons.uoguelph.ca/>
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: <http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help> and <http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help>

7.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. <https://www.uoguelph.ca/counselling/>
- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. <http://www.selfregulationskills.ca/>

7.4 Personal information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) <http://www.e-laws.gov.on.ca/index.html>. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies please see the Undergraduate Calendar.
(<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml>)

7.5 Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning as they become available.

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

8.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and

alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website

<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website

<https://www.ridgetownc.com/services/accessibilityservices.cfm>

8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community—faculty, staff, and students—to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of

their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

8.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

8.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major

assignment).

8.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campus/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campus/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
