

**University of Guelph
College of Biological Sciences
Department of Integrative Biology**

**BIOL*2400 Evolution
0.5 credits (3 lectures per week)**

Prerequisites: (BIOL*1070, BIOL*1090) or BIOL*1040

Course Outline

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 community) and across space and time. It also introduces historical forms of scientific inquiry, unique to biology.

Learning Objective: A student will seek to build conceptual and inquiry skills to understand biodiversity at all levels of biological organization that are based on evolutionary principles and methods. Specifically, a student will gain expertise in the following areas:

(1) Conceptual skills:

- (a) Differentiate Darwinian and modern evolutionary theory.
- (b) Principles of phylogenetic tree estimation and interpretation.
- (c) An awareness and basic analysis of the mechanisms of evolutionary change at the genetic, molecular and phenotypic level.
- (d) Identify, differentiate and give examples of processes such as sexual selection, multilevel selection and co-evolution.
- (e) Identification of species concepts and mechanisms of speciation.

(2) Inquiry skills:

- (a) Awareness of the comparative method and how it is applied across biological disciplines, with some elementary practice using the method.
- (b) Awareness of and elementary practice in model building and hypothesis testing in evolutionary biology.

(3) Basic skills:

- (a) Comprehension of scientific material.
- (b) Organized acquisition and filtering of scientific concepts, facts and methods through note taking and study.
- (c) Written communication of scientific ideas.

Course Topics:

- A. Overview of history of life
- B. Darwin's theory of descent with modification through natural selection
- C. Phylogenetics and the comparative method
- D. Evolutionary genetics, including molecular and phenotypic contexts
- E. Evolutionary processes such as multi-level selection, co-evolution and sexual selection
- F. Speciation, extinction and macroevolution

Evaluation criteria:

Regular assignments, within term exams and a final exam (under review and potentially subject to change)

Textbook & reference material:

Evolution: Making Sense of Life by Zimmer & Emlen

Instructor:

Cortland Griswold, Department of Integrative Biology, cgriswol@uoguelph.ca

General University Policies (see course syllabus, provided on the first day of class, for specific course information):

E-mail Communication

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

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 in writing, with your name, ID number, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration:

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

Drop Date

For regulations and procedures for Dropping Courses, see the Undergraduate Calendar:

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

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.

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing

services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: <http://www.csd.uoguelph.ca/csd/>

Academic Misconduct

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 discourages misconduct. 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.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

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

Recording of Materials

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

Resources

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

<http://www.uoguelph.ca/registrar/calendars/index.cfm?index>