# BIO120H1F – Adaptation & Biodiversity



Department of Ecology and Evolutionary Biology, University of Toronto

# Course Syllabus – Fall 2014

## The BIO120H team

Lecturers:	Corey Goldman, Course Coordinator			
Prof. James Thomson	Jill Wheeler, Laboratory Coordinator			
(Lectures 1-12)	Carol Finlay, Course Administrator			
Prof. Stephen Wright	Arvid Ågren, Lecture TA + many Laboratory Teaching Assistants			
(Lectures 13-24)	Dom Fenech and Mary Ann Honig, Laboratory Technicians			

## BI0120H office - bio120@utoronto.ca

- Please direct all course enquiries to the BIO120 office; the office will re-direct enquiries as appropriate.
- ES 3045A (Earth Sciences Centre, enter off 33 Willcocks, take stairs to third floor), 416-978-7588
- Please include your full name and student number when emailing the BIO120 Office (bio120@utoronto.ca).
- Office hours: Monday to Thursday 11:00 a.m. to 1:00 p.m. or by appointment.

## **Course description**

Principles and concepts of evolution and ecology related to origins of adaptation and biodiversity. Mechanisms and processes driving biological diversification illustrated from various perspectives using empirical and theoretical approaches. Topics include: genetic diversity; natural selection; speciation; physiological, population and community ecology; maintenance of species diversity; global environmental change; conservation, species extinction, and invasion biology. Prerequisite: Grade 12 Biology or equivalent. Exclusion: BIO150Y1Y.

# **Course objectives**

- 1. A goal of this course is to provide you with a solid foundation in evolutionary and ecological principles and concepts—as related to the origins of adaptation and biodiversity—so that you can make informed decisions on pressing societal issues, such as population growth, global environmental change, and the conservation of biodiversity, and be prepared for advanced study in the biological sciences.
- 2. Darwinian evolution is the unifying concept in biology and explains biodiversity on earth and why species differ. You will learn that the traits of organisms are the product of a complex interplay between natural selection, genetic variation, and constraints imposed by evolutionary history.
- 3. You will learn that adaptive evolution is a process that results from selection pressures imposed by the physical and biotic environment on individuals within populations. The ecological challenges of capturing resources for growth, successful reproduction, and avoiding enemies largely determine the ways organisms function.
- 4. Required readings will extend and reinforce lecture material on how natural systems work and how diverse organisms respond to the challenges of the natural world. From reading *Why Evolution is True*, you will learn how various independent lines of evidence demonstrate the fact of evolution and give insight into its mechanisms, particularly adaptation by natural selection. Both the *Nature Education Knowledge* articles and the material written by Prof. Thomson will extend and reinforce lecture material on how natural systems work and how diverse organisms respond to the challenges of the natural world.
- 5. In the laboratories you will learn to make observations, devise hypotheses, and conduct experiments in ecology and evolutionary biology, including critically evaluating and communicating (both orally and in writing) hypotheses and experimental designs.

A paper copy of this syllabus is available in your BIO120 Laboratory Manual.

#### **Required course materials** (#1 and #2 are available from the U of T Bookstore)

1. BIO120 Laboratory Manual Fall 2014 (Read Chapters 1 and 6 before your first lab.)

<u>Note</u>: You cannot use previous lab manuals (e.g., if you took BIO120 in a previous session, you cannot re-use your lab manual), as the manual is revised each year.

- 2. Why Evolution is True by Jerry Coyne (paperback edition, Penguin).
- 3. Lecture material written by Prof. Thomson available on the course site on the Portal.
- 4. Selected articles available online (free) from the Ecology section of Nature Education's Knowledge Project; details are provided on the course site on the Portal.
- 5. *Population Growth*, an interactive chapter/module available online (produced by Simbio.com) and downloaded to your computer. The cost is \$9; this amount is included in the cost of the BIO120 Laboratory Manual (so you do not pay an additional \$9). Further information, such as how to access, will be provided on Portal and by Prof. Thomson in class.

## **Course site on the Portal**

The BIO120 site on the U of T Portal (portal.utoronto.ca) contains: a copy of this course syllabus, announcements, lecture slides and audio files, lab-related content, discussion board, test and lab marks, reading quizzes, and sample test questions. Only students who are enrolled in BIO120 on ROSI have access to this site (within 24-48 hours after enrolling). **It is mandatory that you check the announcements at least once a week.** For information about setting up your UTORid, logging into the Portal, and using Blackboard, please visit: www.portalinfo.utoronto.ca/content/information-students

# Lectures

- Day section (L0101): Monday and Wednesday 10:10-11:00 a.m. in Convocation Hall (CH)

- Evening section (L5101 and L2001): Wednesday 6:10-8:00 p.m. in ES 1050 (Earth Sciences Centre Auditorium, 6 Bancroft Ave.)

- See table on page 5 of this syllabus for schedule of lectures.
- Students can attend either lecture section, but note that seating is limited in the evening.
- There is a folder for each lecture under "Lectures" on the Portal. Each folder contains:

- Lecture slides: These will be available on Friday afternoon for Monday lectures, and on Tuesday afternoon for Wednesday lectures. To conserve paper and ink, we request that you consider printing: six slides per page, on both sides of a page or use previously used paper, and use only black ink.

- Audio files: Audio files of Monday and Wednesday day lectures will be available on the Portal on

Thursday. (Note that there is no guarantee that audio files will be available for a given lecture, as it is possible that recording equipment could fail.) Evening lectures are not recorded.

- Required readings: The pages that you are required to read before each lecture will be posted on the Portal.

## Lecture tutorials

These are the times when you can ask the lecturer questions about the content of the lectures: **Mondays 5:10-6:00 p.m.** in ES 1050, and **Wednesdays 8:00-9:00 p.m.** after the evening lecture (also in ES 1050). You can attend either the Monday or Wednesday session or both; attendance is optional. Format is "question and answer."

## **Reading quizzes**

- Quizzes will be available on the Portal to assist you in assessing your understanding of the required readings and to motivate you to do the readings before each lecture.

- Detailed information on the reading quizzes is available on the Portal under "Reading Quizzes".

- You must obtain a perfect score (100%) on Quiz 1 in order to be eligible to receive a mark for any of the subsequent quizzes (although Quiz 1 is not worth any marks itself).

- You must obtain a perfect score on a quiz in order to receive a mark for it.
- Quizzes can be attempted multiple times (until you obtain a perfect score).

## Laboratories (also read the BIO120 Laboratory Manual for detailed information)

- Check the "My Grades" link on Portal after 5:00 pm on Friday, Sept. 12; there will be a column that shows the week, day, time and room number of your lab.

- Labs are held in alternate weeks (bi-weekly); see the detailed lab schedule in your BIO120 Laboratory Manual.

- Week 1 (P\*\*01) labs begin the week of Sept. 15; Week 2 (P\*\*02) labs begin the week of Sept. 22.

- All labs are held on the first floor of the Ramsay Wright (RW) building, 25 Harbord St.

- Labs are 3 hours in length. Tues., Wed., and Thur. afternoon labs begin at 1:30; Thur. evening labs begin at 6:10; and Fri. morning labs begin at 11:10 am. (There are no BIO120 labs on Mondays.)

- A lab coat is required for Labs 2, 3, and 4.

- Preparation for Lab 1: Read Chapters 1 and 6 in the BIO120 Laboratory Manual Fall 2014.

- Beginning on Sept. 9, if you are <u>not</u> enrolled in a practical section on ROSI, please contact Carol Finlay at bio120@utoronto.ca.

- Procedures for requesting a temporary lab change (for example, due to illness) are discussed in the "Important Policies and Procedures" section on page 4 of this syllabus.

# Academic support

- Any questions on **lecture** content can be (1) asked during the weekly Lecture Tutorials conducted by the professors (see page 2), or (2) posted on the BIO120 discussion forum on the Portal, which is monitored by the BIO120 Lecture TA (a Teaching Assistant who attends lectures). The Lecture TA can also be available for small-group help sessions (by appointment).

- Any questions on **laboratory** content can be (1) directed to the BIO120 Lab Coordinator Jill Wheeler during her office hours (see "Contacts" on the Portal), or (2) posted on the BIO120 discussion forum on the Portal.

- The **discussion forums** on the Portal have been created for students to post their questions regarding course material. It is expected that students will respond to their classmates' questions. Course staff will respond to posts where appropriate (and within 48 hours, weekdays only).

## Evaluation

Lecture material, including required readings	70%				
Lab material, including required readings	30%				
You must obtain a minimum average of 50% on the laboratory material (lab quizzes, assignments, etc., and lab material on Test 2 and Final Exam) in order to pass the course.					

#### **Evaluation details:**

Test 1 on Monday, Oct. 6, 6:10-7:00 p.m. (50 minutes)					
- Content: 25 multiple-choice questions covering Lectures 1 to 8 (Prof. Thomson), including associated					
required readings. (Lab material will not be evaluated on Test 1.)					
<b>Test 2</b> on Tuesday, Nov. 4, 7:30-8:30 p.m. (60 minutes)					
- Content: 30 multiple-choice questions (12 questions from Prof. Thomson's Lectures 9 to 12, 10 questions					
from Prof. Wright's Lectures 13 to 15, and 8 questions from Lab Chapters 1 to 3 and Appendix B,					
including associated required readings).					
Final Exam (during Dec. 8-19 exam period, exact date TBA), 120 minutes					
- Content: 60 multiple-choice questions (12 questions from Prof. Thomson's Lectures 1 to 12, 40 questions					
from Prof. Wright's Lectures 13 to 24, and 8 questions from Lab Chapters 1 to 5, and Appendices A, B,					
and C, including associated required readings).					
- Note that this exam is "cumulative" (that is, it does include all course material).					
Laboratory guizzes and assignments					
- Lab Quizzes (7%) and "Writing a Scientific Proposal" assignment (15%).					
- See the BIO120 Laboratory Manual for detailed information, including associated required readings.					
Quizzes	5%				
- Quizzes on Prof. Thomson's written material, Nature Education Knowledge articles and Why Evolution is					
<i>True</i> (4%)					
- Quiz on Population Growth online module (1%)					

#### Important course policies and procedures (please read these carefully!)

(1) Your quiz, assignment, test, and exam **grades for BIO120 will be visible to you on the Portal**. It is your responsibility to check your grades and report any inconsistencies to the BIO120 Office as soon as possible.

(2) Please send all course-related email to <u>bio120@utoronto.ca</u>; Carol Finlay will forward your email to the appropriate team member. Include your full name and student number in the body of the message. You should use your UTORmail address or else your emails are likely to be diverted to Junk Mail.

(3) Test 1, Test 2, and the Final Exam consist of multiple-choice questions; marks are not deducted for incorrect responses. Test locations will be posted on the Portal. Bring an HB pencil, eraser, and your T-card to all tests/exams; no aids are permitted (no cell phones, calculators, dictionaries, etc.).

(4) If you **miss Test 1** due to illness you must contact the BIO120 Office no later than Tues. Oct. 7; valid documentation is required in order to be considered to write the make-up test. If you **miss Test 2** due to illness you must contact the BIO120 Office no later than Wed. Nov. 5; valid documentation is required in order to be considered to write the make-up test. The make-up tests consist of short-answer or essay questions (i.e., not multiple-choice) and are typically written on the Friday morning of the week following the test at 7:30 a.m. **Valid documentation consists of one of the following: U of T Medical Certificate (available online), U of T Health Service Form, or letter from your College Registrar.** 

(5) If you **miss the Final Exam** you must contact your college registrar and initiate a petition to write a deferred exam. If your petition is granted, the exam is typically written during the next Faculty Examination Period.

(6) **Test conflict with a scheduled class**: If you have a scheduled class at a time when Test 1 or Test 2 is being written *your class* takes precedence (i.e., attend your lecture and write the early test sitting for BIO120). Contact the BIO120 Office no later than *two weeks* prior to the test date to arrange to write the early sitting. Please provide a copy of your timetable as proof of the conflict.

(7) If you **miss your scheduled lab period** for an authorized reason (e.g., illness), present valid documentation (see #4 above) to the BIO120 Office during office hours <u>within one week</u> of the missed lab to find out if space is available to attend another lab during the two-week period that each lab is offered. It is important to note that you are permitted to make up <u>only one missed lab</u> with the appropriate documentation. Serious illness affecting two consecutive labs or more will be considered on an individual basis. <u>Note that you are responsible for</u> <u>submitting any assignments that are due for the lab you missed; no extensions will be granted for assignments on or after their due date. E-mail your assignment to: jill.wheeler@utoronto.ca, or submit it online (when appropriate).</u>

(8) Labs begin at 1:30 p.m. on Tuesdays, Wednesdays, and Thursdays; at 11:10 a.m. on Fridays; and at 6:10 p.m. on Thursday evenings. **If you arrive late to lab**, the teaching assistant will send you to see the Lab Coordinator. She will decide if you have missed too much of the lab and therefore cannot remain to complete it.

(9) The lab quizzes are completed on the Portal. They are available for seven days preceeding the start of lab. No extensions or exemptions are allowed if you do not write the quiz by the start date and time of the associated lab. Detailed information on the quizzes is available on the Portal.

(10) The University of Toronto is committed to accessibility. **If you require accommodations** for a disability, or have any accessibility concerns about the course, the classroom or course materials, contact Accessibility Services as soon as possible: disability.services@utoronto.ca *or* studentlife.utoronto.ca/accessibility.

(11) Read pages 6-9 and 6-10 in the BIO120 Laboratory Manual for **important policies for the "Writing a Scientific Proposal" assignment**.

(12) **Turnitin.com**: Students will submit their "Writing a Scientific Proposal" report (Chapter 6 in the BIO120 Laboratory Manual) to Turnitin.com. Normally, students will be required to submit their report to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their reports to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com; please are described on the Turnitin.com web site. You can choose to not submit their report to Turnitin.com; please contact the Lab Coordinator before Tuesday, Oct. 14th to make alternate arrangements.

(13) BIO120 has a zero tolerance policy for **plagiarism**. If you are caught plagiarizing the work of others in any of your assignments, you will receive a grade of zero for the assignment and the Office of Student Academic Integrity will be notified.

Week	Date	Labs	Monday		Wednesday					
			Lecture 10-11 a.m.	Tutorial 5-6 p.m.	Day Lecture 10-11 a.m.	Eve Lecture 6-8 p.m.	Tutorial 8-9 p.m.			
1	Sept 8-12	No labs	1	no	2	1 + 2	yes			
2	Sept 15-19	1-1*	3	yes	4	3 + 4	yes			
3	Sept 22-26	1-2*	5	yes	6	5 + 6	yes			
4	Sept 29-Oct 3	2-1	7	yes	8	7 + 8	yes			
5	Oct 6-10	2-2	9	yes	10	9 + 10	yes			
			<b>Test 1</b> : Mon., Oct. 6, 6:10-7:00 p.m. (Lectures 1 to 8)							
6	Oct 13-17	3-1	U of T closed		11	11 + 12	yes			
7	Oct 20-24	3-2	12	yes	13	13 + 14	yes			
8	Oct 27-31	4-1	14	yes	15	15 + 16	yes			
9	Nov 3-7	4.2	16	yes	17	17 + 18	yes			
		1NOV 3-7 4-2	<b>Test 2</b> : Tues., Nov. 4, 7:30-8:30 p.m. (Lectures 9 to 15, Labs 1 to 3, App. B)							
10	Nov 10-14	5-1	18	yes	19	19 + 20	yes			
11	Nov 17-21	5-2**	November Break		20	21 + 22	yes			
12	Nov 24-28	No labs**	21	yes	22	23 + 24	yes			
13	Dec 1-5	No labs	23	yes	24 (Dec 3)	no lectures	no			
Facu	Faculty exams (Dec. 8-19): <b>BIO120 Final Exam</b> on Lectures 1 to 24, and Lab Chapters 1 to 5, and App. A to C									

# Schedule for Lectures, Tutorials, Labs, and Tests

\* 1-1 = Lab 1, Week 1

1-2 = Lab 1, Week 2

\*\* P0202 labs that fall on Tuesday, November 18<sup>th</sup> will be held on Tuesday, November 25<sup>th</sup>.