

Department of Biology Course Outline

SC/BIOL 2050 4.00 Ecology
Fall 2015

Course Description

A study of the interactions between organisms and their abiotic environments, presented in an evolutionary context. Includes processes of evolution, ecosystems and communities, competition, predation, population ecology and current environmental problems such as habitat loss and extinction. Three lecture hours, three laboratory hours. One term. Four credits.

Prerequisites

SC/BIOL 1010 6.00 or SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00. Prerequisite or corequisite: SC/BIOL 2060 3.00. Course credit exclusion: SC/BIOL 2050 3.00.

Course Instructors and Contact Information

Lectures: Dr. Lortie, lortie@yorku.ca Labs: Alex Filazzola, alex.filazzola@outlook.com
Please contact instructor and lab administrator directly to book appointments for office hours.

Schedule

Lectures: Friday 8:30am 180 minutes in VC 135
Labs: M-F 2:30pm 180 minutes LUM 117 or 118

Evaluation

Overview

Lectures valued at 50% & labs valued at 50% - **even split** to ensure fair, balanced reward for time. Focus on evaluating your **ongoing work** via student notebooks in lectures & also grading the data you collect in labs.

Lecture component

Lecture test	20%
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Student notebooks	10%

Lab component

Datasets with meta-data & methods x 3 (5% each)	15%
Experimental design	5%
Lab report	20%
Critical thinking exercise	10%

Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

Important Dates

Lecture component

Oct 2, 2015 Lecture test #1 20%
Nov 6, 2015 Lecture test #2 20%
Dec 4, 2015 Lecture student notebook submission 10%

Lab component

Sept 28-Oct 2, 2015 by 230pm on your lab day. Dataset & meta-data from lab techniques part I 5%
Oct 5-9, 2015 by 230pm on your lab day. Dataset & meta-data from lab techniques part II 5%
Oct 12-16, 2015 by 230pm on your lab day. Experimental Design proposal 5%
Nov 9-13, 2015 by 230pm on your lab day. Dataset with meta-data from your independent group experiments 5%
Nov 16-20, 2015 by 230pm on your lab day. Lab reports 20%
Nov 30-Dec 4, 2015 in labs. Critical thinking test in labs.

NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at <http://www.yorku.ca/yorkweb/cs.htm>

Resources

Lecture material	Slides provided by instructor
Textbook	Cain et al. Ecology textbook. Third Edition.
Lab manual	Provided on course website
Readings	Provided by instructor and teaching assistants
Software	Open source: figshare.com and plot.ly and Excel

Learning Outcomes

Upon successful completion of this course, students should be able to:

- (1) Summarize the salient principles associated with the major research topics in ecology.
- (2) Critically assess the primary and second research literature in the environmental sciences.
- (3) Link ecological principles to contemporary environmental issues.
- (4) Critically write a balanced, evidence-based essay on global ecology and the environment.
- (5) Interpret ecological figures and datasets published in the primary literature.
- (6) Publish data with meta-data.
- (8) Effectively communicate field ecology methodology.
- (9) Design an ecological field experiment.
- (10) Apply critical thinking skills to a bibliographic workflow and ecological syntheses.

Course Content

The main purpose of the lectures is to develop the declarative knowledge you need for the environmental sciences and upper-year courses. Lectures will thus provide you with a solid ecological schema of principles for the environmental sciences. The labs will provide you with procedural knowledge of the skills and macro-procedures you will need for eco/evo/environmental research.

There are three modules in the lectures including the following:

- (i) individuals & evolution
- (ii) interactions & communities
- (iii) global patterns in the environment.

The **first two thematic blocks are immediately followed by a two-part test** in the regularly scheduled lecture time slot.

A **two-part test is 20 multiple-choice questions worth 10% of the test and a second short-answer component worth the remaining 10%**. The short answers are directly coupled to the 20 multiple-choice in that the student selects 5 of the 20 and provides a detailed answer why the particular answer

was selected. This form of test thus provides the student with an opportunity to share their thought processes, communicate their problem solving skills, and also rewards students that are stronger in communicating and solving versus purely memory-based skills.

The **final thematic unit, global patterns, will be evaluated using the student notebooks worth 10%**. These notebooks are designed to reward attendance, participation, critical thinking, innovation, and asking good questions. The final three weeks of lecture notes within each student notebook will absolutely be graded for 6 of the 10% of the total value of the notebooks. Another 2 weeks will be selected at random by the marker from throughout the remainder of the term.

Notebook format

Every week should include the following elements within a student notebook

- (a) Lecture notes
- (b) Reading notes
- (c) Critical thinking notes & questions

Notebooks are thus an effective reward to students that attend lectures because a proportion of the notes should include ideas presented and discussed in the actual lectures. We need to recognize the efforts of students that attend and participate in making classes more exciting, dynamic, and interactive. Notes are the perfect outlet. **Even if you do not speak up in class, use the lectures as opportunity to capture ideas discussed by professor or students.** The reading component of the notes is a brief summary of the readings assigned from text and peer-reviewed primary publications. These notes should focus primarily on the assigned papers. Finally, the critical thinking weekly component is your chance to sketch up ideas, ask questions, challenge ideas you do not agree with or understand. This can be from lectures, any readings, or discussions.

Notebook summary: WEEKLY notes on (a) lecture (b) assigned reading (c) critical ideas & questions.

A **typical lecture** will be comprised of the following elements in this course. Lectures are designed to capitalize on the 3-hour single weekly time block.

Part 1 of most lectures. **Professor presents textbook reading** with powerpoint slides. Typical length lecture for 50-60 minute lecture.

Part 2. Professor presents short, PechaKucha presentation (<http://www.pechakucha.org>) on assigned reading.

Part 3. Active student-professor flipped lecture approach to **critical analysis of readings and designing test questions**. Test questions will NOT be posted online so attendance in lectures by students is very important.

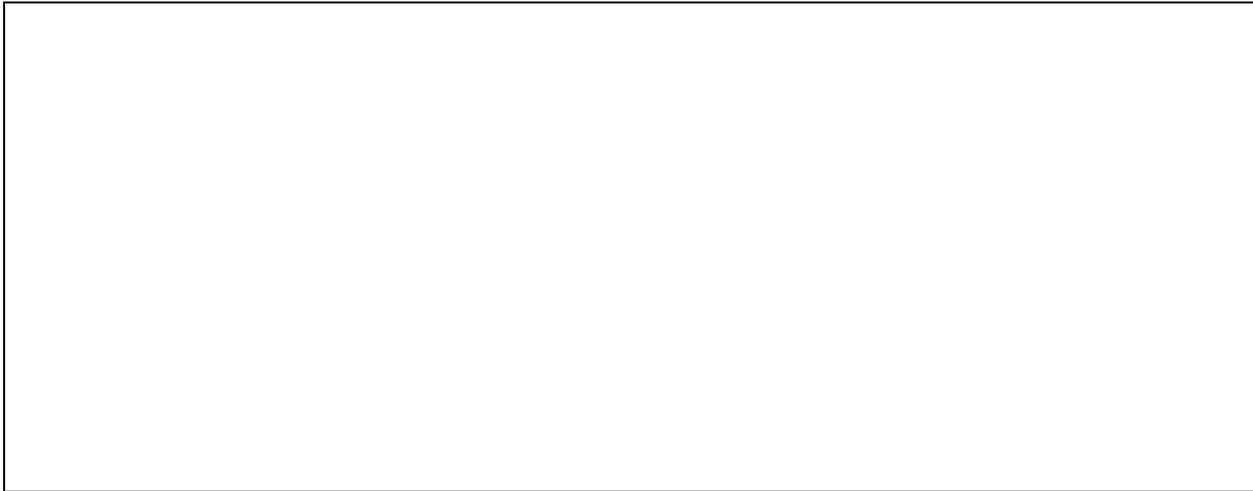
Both tests will be designed to ensure that at least 50% of the questions are from the ones we generate collectively in the lecture.

In the labs, there are four independent modules including the following:

- (i) techniques & data
- (ii) experimental design
- (iii) big data
- (iv) critical thinking skills.

The primary focus of labs is 'practical' skills. Experimental design, doing an experiment with time provided, and **rewarding and grading participating in open science and publishing data online**. A full 20% of the course this grades the work you do in collecting data and designing an experiment. You work together in groups but are graded individually on data and experimental design. This is necessary as it a critical skill in knowing how to format evidence (data) and communicate what it means (meta-data). **Hence, all grading is individual.**

The final component of the course is a set of training and exercises to ensure that students have the necessary critical thinking skills identify by the Biology and Environmental Science Departments for upper-year courses.



Experiential Education and E-Learning

Experiential education. Student will be provided with hands-on, highly practical field and lab experience in ecological methodologies, experimental design, and data handling. In the lectures, there will be a focus on critical thinking and deconstructing the principles of ecology from research. Students will also have experience with literature searches and effective topic and hypothesis delineations.

E-learning. Students will be provided with the opportunity to explore data repositories and evaluated on use of data sharing tools. Twitter and a discussion blog will also be use to facilitate open discovery and connection of principles. Students will also be provided with the opportunity to further research skills using online bibliographic databases.

Other Information

EXPECTATIONS

Attendance is MANDATORY because the lectures will provide an opportunity for the students not only to listen to summary lectures of the readings by the professor but to also engage in critical thinking discussions on the principles of ecology. In the lectures, we will work together to design many of the test questions (but not the answers). All information presented in class including information not provided on lecture slides and the additional resources is testable.

Course Policies

If the in-class tests are missed for a valid, well documented reason, the student will NOT receive a grade of 0 for that evaluation tool if the following conditions are met (1) the course director is notified within one week of the evaluation, and (2) all relevant documentation is provided within one week in person at the next lecture. Alternative assignments/evaluations are also not available in the lab component of the course. The data with meta-data and methods are a form of participation to recognize the efforts of students that keep up to date on their research and work. If the teaching assistant and lab administrator are notified within one week and relevant documentation is also provided at the time, the lab administrator will note the valid absence from submission of lab work and your lab component will be differentially weighted to avoid penalty for valid absence. However, to complete the course, you must complete at least 30% of each of the evaluations in the lab and 30% of the lecture work.

To promote fairness and student responsibility, all in class exercises are due on the dates specified on the course website. A 20% penalty will be applied for the first day the exercise is late and 5% every day thereafter. Students who anticipate being unable to submit the exercises on the due date are encouraged to submit early.

Grades on exercises and exams are not negotiable. Every reasonable action is made to ensure multiple

assessments of the assignments before conveying grades to assure consistency across the entire class. Thus, the course director should only be contacted if there is calculation or clerical error present.

Students are not allowed to record lectures or lab tutorials using their own devices.

University Policies

Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <http://www.glendon.yorku.ca/counselling/personal.html>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

Ethics Review Process

York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants*. In particular, students proposing to undertake research involving human participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at

http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf (PDF)

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-and-or-harassing-behaviour-in-academic-situations-senate-policy/>