

Department of Biology Course Outline

SC/BIOL 2050 4.00 Ecology
Fall 2016

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 SLH D
Labs: Monday to Thursday 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 | 30% |
| Open notebook, solve a problem | 20% |

Lab component

| | |
|-------------------------------------------------|-----|
| Datasets with meta-data & methods (4 x 5% each) | 20% |
| Lab report | 30% |

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

Important Dates

Lecture component

Oct 21, 2016 Lecture test 30%
Nov 25th, 2016 Open notebook, solve a problem 20%

Lab component

Sept 26-29, 2016, Dataset & meta-data from lab techniques 5% (plant OR animal)
Oct 3-6, 2016, first real field dataset (5%)
Oct 17-20, 2016, second real field dataset (5%)
Oct 24-27, 2016, third real field dataset (5%)
Nov 19, 2016, lab reports due by 10pm using turnitin (30%)

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 r |

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.

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

- (i) techniques & data
- (ii) experimental design
- (iii) 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. You work together in groups. This is necessary as it a critical skill in knowing how to format evidence (data) and communicate what it

means (meta-data).

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.

Lectures

| wk | date | principles | lecture | topic |
|----|-----------|-------------------------------------|-----------------|-------------------------------------------------------------------------|
| 1 | sept 9th | Introduction | CH1 & paper | Introduction to course (outline, notebooks, figshare). What is ecology? |
| 2 | sept 16th | Individuals & evolution | CH6 & paper | Evolution |
| 3 | sept 23rd | Individuals & evolution | CH9 & paper | Population ecology |
| 4 | sept 30th | Interactions & communities | CH12 & paper | Competition |
| 5 | oct 7th | Interactions & communities | CH15 & paper | Mutualism & commensalism |
| 6 | oct 14th | Interactions & communities | CH16 & paper | Community ecology |
| 7 | oct 21st | test | lecture test | Value: 30% |
| 8 | nov 4th | introduction to data science & r | readings online | Introduction to data science, evidence, & r in ecology/enviro sci |
| 9 | nov 11th | Global patterns | CH19 & paper | Diversity |
| 10 | nov 18th | Global patterns | CH25 & paper | Global ecology: invasion & climate change |
| 11 | nov 25th | open notebook, solve a problem | problem solving | Value: 20% |
| 12 | dec 2nd | problem solving & critical thinking | readings | critical thinking skills |

Labs

See lab manual for list of exercises. The PRIMARY PURPOSE of the field exercises in the labs to collect REAL data about our campus ecosystems. Here is the link to the protocol, instructions, and purpose of the labs: <http://www.campusecology.network>

We have invited other universities to participate in collecting similar data.

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.

It is the responsibility of the student to ensure that ALL files uploaded to TurnItIn are entire and in a compatible, readable format. Any files that we cannot open (i.e. due to corruption) will be marked as zero. Computer related issues are not an acceptable exception for overdue reports.

Course Policies

If the in-class tests are missed for a valid, well documented reason, the student will be provided an 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. 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.

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.

Student's 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/>