

Department of Biology Course Outline

SC/BIOL/ENVB 2050 4.00: Ecology
Fall 2018

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 per week; three laboratory hours in roughly alternate weeks. 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 Instructors and Contact Information

Instructor / Course Director: Dr Mark Vicari

- **Email:** mvicari@yorku.ca. Please use this email as the address of first contact for all matters relating to lectures (including tests/exams and assignments other than labs). Include BIOL 2050 in the subject line.
- **Office Hrs, 102 LSB: Tues & Thurs, 1:15-2:15**, or by appointment

Lab Coordinator: Ms Stephanie Haas

- **Email:** b2050lab@yorku.ca. Use this email for lab switches, missed labs and all other matters related to lab administration.
- For lab-related academic issues please contact your TA (contact info TBA during your first lab meeting, week of Sept. 10).

Schedule

Lectures: Fridays 08:30-11:30 in SLH-A

Labs: Mon, Tues, Wed, Thurs or Fri, 14:30-17:30 in Lumbers 118. Three hours in approximately alternate weeks.

For detailed lecture and lab schedules please see the course Moodle site.

Evaluation

Letters to the Editor (2)	10% (5% each) – due Fri. Sept. 28 and Fri. Nov. 2
Research Essay	10% – due Fri. Nov. 9
Mid-term test	10% – Fri. Oct 19 at 8:30 a.m.
Final exam	28% – fall exam period, Dec. 6-21
Laboratory write ups (3)	27% – Labs 3-5 (one report) = 10%, due week of Oct. 15* – Lab 6 = 5%, due week of Nov. 12* – Lab 2 = 12%, due week of Nov. 26*
Lab quizzes (2)	10% (5% each) – weeks of Oct. 15 and Nov. 12*
In-class participation (REEF polling)	5%

* during your regularly scheduled lab

Test format

* Approx. 60-70% of marks based on multiple choice questions; 30-40% based on short answer questions

In-class participation will be assessed using the smartphone-based REEF system.

- * Questions will be marked for participation only; there is no penalty for submitting an incorrect answer, as long as an answer is submitted.
- * The lowest 20% of polling sessions (lectures) will be dropped in calculating student participation grades. This is to account for dead cellphone batteries, classes missed for any reason, etc. Additional exemptions for classes missed due to illness will not be granted (i.e. they will count among the 20% of lectures that are automatically dropped in calculating your participation grade).

Important Dates

Lectures begin Friday Sept 7

Labs: formal labs (in room 118 Lumbers) begin week of Sept. 10, starting with lab #3. Labs #1 and 2 are independent assignments to be completed on your own time.

Midterm test: Friday Oct 19, 8:30 am

Last date to drop course without receiving a grade: Friday Nov 9

Final Exam: to be held during the fall examination period, Dec. 6-21. Exact date, time and location TBA by the registrar's office. Students should not book plane tickets, vacations etc. during this period until the exact date of the exam is known.

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

Textbook: T.M. Smith, R.L. Smith and I. Waters. 2014. *Elements of Ecology, Canadian ed.* Pearson, Toronto.

Lab materials: There is no formal lab manual. Lab handouts will be available on the Moodle website. Students must purchase one online lab (\$6 US) and download it onto their own laptops or desktops (or on a USB key, if students don't have their own computer).

Website: The course will be managed through a Moodle site. Please log in at:
<https://moodle.yorku.ca/moodle/>

Course Content

There are now more than 7.5 billion people on Earth – more than two and a half times the number that existed in 1960. Since people take up space, the rate at which natural habitats are being lost has skyrocketed. Species extinction rates mirror this. At the same time, emissions of greenhouse gases are causing global climate change. **What does this all mean and how do we make sense of it?**

Ecology is the study of biology at the individual, population, community and ecosystem levels, focusing on interactions of organisms with one another and with their abiotic environment. Ecologists try to understand what determines the patterns of distribution and abundance of organisms. Ecologists also aim to predict how ecosystems respond to "disturbance". The central ideas, theories and principles of ecology are, thus, directly relevant to the issues described above.

We will consider: approaches to the study of ecology and experimental design; the link between ecology and evolution; biomes and climate; adaptations of animals and plants; properties of populations; population growth; competition, predation and mutualism; community structure and dynamics; factors that influence species richness and biodiversity; energy flux and nutrient cycling in ecosystems; sustainability; the biodiversity crisis; and the impact of climate change on biodiversity.

Learning Outcomes

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

- Describe the types of studies and techniques, including basic statistical methods, used in ecological research.
- Describe how natural selection, and events that occur in evolutionary time, are influenced by events that occur in ecological time, using case studies as examples
- Describe how and why climatic conditions vary over the earth, and the effect of climatic variables on the distribution of populations, communities and ecosystems
- Define the term "niche" as used in ecology, explain what factors determine the niche of a species, and explain how the niche concept can be used to understand the distribution of organisms
- Describe the constraints associated with living in terrestrial and aquatic environments and the adaptations of animals and plants for those environments
- Describe the features of the major terrestrial and aquatic biomes and what factors influence their distribution.
- Describe the techniques used for measuring population size in different types of organisms.
- Define the term "life history strategy" and give examples of organisms that illustrate the range of different life histories seen in nature
- Use appropriate population growth models to predict population size and growth rates
- Describe how competition, predation and mutualism influence the size, structure and dynamics of populations and communities, using mathematical and other models.
- Explain the importance of metapopulations in conservation biology and the use of models describing metapopulation dynamics.
- Use food web diagrams to predict how populations within communities are regulated, with reference to "top-down" and "bottom-up" regulation.
- Discuss the factors that influence community organization, dynamics (including succession), productivity and stability
- Describe how energy and nutrients cycle through ecosystems and the impact of human activities on those cycles
- Discuss the sustainability of human activities such as agriculture and harvesting from the wild, in the context of human population growth
- Describe the factors that influence global patterns in the distribution of biodiversity
- Describe the causes of the current biodiversity crisis and what steps have been / should be taken to address the crisis
- Discuss the implications of climate change for the future of earth's biodiversity
- Find and use primary research articles to write a short literature review on an ecological topic
- Design and conduct an experiment to collect original ecological data
- Analyze original data using statistical techniques and present those data in a report
- Use identification keys to identify species
- Write an effective letter to an editor for publication in a mainstream newspaper or magazine

Experiential Education and E-Learning

Lab 2: designing an ecological study; performing independent field work; collecting, analyzing and interpreting original data.

Labs 3, 4 and 5: plant identification; assessing diversity of different community types in the field; sample collection in the field; analyzing and interpreting original data.

Lab 6: using computer simulations to test ecological hypotheses.

Course Policies

Course Contacts:

- For matters relating to lectures, tests/exams, and assignments handed in in lectures:
 - Dr. Mark Vicari, Course Director: mvicari@yorku.ca
- For lab administrative matters (e.g. missed labs due to illness):
 - Ms Stephanie Haas, Lab coordinator: b2050lab@yorku.ca
- For academic questions about labs: your TA (contact info TBA in your meeting)

Email etiquette:

- **Subject line:** please begin with "BIOL 2050" followed by a brief, but reasonably detailed, indication of the subject of your email (e.g., "question about lecture 3", "missed midterm", etc.)
- **Body of the email:** remember to include your name and student number at the end of every email.
- **Response time:** please allow 2 working days.

Posting of lecture material online:

- Lecture slides (.pptx) will be posted on the class Moodle website within 24-48 hrs after each lecture. A preview version of the lecture will usually be posted 1-2 hrs prior to each lecture.
- The course is not designed as a distance course. Some material will only be delivered during the lecture.

Copyright and Intellectual Property:

- Photographs or video recordings of any portions of the lectures (including the slides) are prohibited. Images and material presented are subject to Canadian copyright law.
- Personal audio recordings are permitted provided they are used **ONLY** as a personal study aid, and are **NOT** sold, passed on to others, or posted online. Lectures are the intellectual property of the instructor and cannot be distributed without permission.

Missed tests / exams

- Students who miss the test or the final exam due to an illness or emergency must provide supporting documentation to the instructor in a timely manner. Documentation should be submitted using the online document submission system:
<https://science.apps01.yorku.ca/machform/view.php?id=84113>
- Tests missed due to medical circumstances must be supported by an Attending Physician's Statement, which can be downloaded from:
<http://www.registrar.yorku.ca/pdf/attending-physicians-statement.pdf>
or a statement by a psychologist or counsellor:
<http://myacademicrecord.students.yorku.ca/pdf/counsellors-statement.pdf>
- **Students are NOT expected to disclose the nature of the illness.** The document must specify: 1) date of consultation; 2) contact information (e.g. phone number of the hospital; legible name of the health provider) that would allow verification of the document; 3) a statement that the student would not have been able to attend class (or carry out activities) during the relevant period of time. Appropriate documentation must be submitted to Dr Vicari as soon as possible after the test.
- Death of an immediate family member: submit death certificate, letter from funeral home or hospital records.
- Other: consult course director by email (mvicari@yorku.ca)
- For students who submit approved documentation, a makeup test/exam will be arranged. Details will be posted on the course Moodle site.

- Note that medical documentation is not required for missed REEF polling sessions; the lowest 20% of lectures will be dropped automatically in calculating your participation grade (see Evaluation section above).

Lab attendance and missed labs:

- **Attendance is required and will be taken at all laboratory classes.** You will not be excused from any lab.
- Each student must attend his/her registered lab section.
- If you miss a session for a valid reason you might be able to make it up, but you must contact the Laboratory Coordinator within 24 hours of your absence to determine if rescheduling is possible.
- The Lab Coordinator will decide whether a makeup lab can be granted for your circumstance. Appropriate detailed documentation supporting the event(s) (typically medical or emergency related) preventing your lab attendance is always required and must be submitted to the lab coordinator as soon as possible. A makeup lab cannot be considered for students who do not submit appropriate documentation.
 - Personal illness: submit Attending Physicians Statement form or statement by a psychologist or councillor; see “Missed Tests/exams” above
 - Death of an immediate family member: submit death certificate, letter from funeral home or hospital records
 - Other – consult with the Lab Coordinator, b2050lab@yorku.ca
- You may permanently change your laboratory section only if space is available in another lab section. All lab switches must be done through the enrolment system by 11:59 pm on **Sept 9th, 2018**.

Turnitin.com:

- In this course, in addition to submitting a hard copy of your work, you will be asked to submit electronic copies of the three lab reports and the research essay to Turnitin.com. This will ensure that your hard work, once added to the database, cannot be plagiarized in the future by students at any university!
- Details on how to register for Turnitin will be provided in class

Religious observance days:

- Should the dates for tests or exams pose a conflict with a religious observance day for your particular religion, you must complete an **Examination Accommodation Agreement Form**, available at
 - http://www.registrar.yorku.ca/pdf/exam_accommodation.pdfand submit it to the instructor **at least 3 weeks before the date of the test**.

Grading and late penalties:

- In order to be fair and consistent to the entire class, individual grades are not negotiable and “extra credit” assignments are not provided at any point during or after the course. Please contact the instructor about a grade **only** if there is a clear error (calculation, clerical, etc.) within two weeks of the grade being made available to you.
- A penalty of 5% per calendar day will apply to all material handed in late.

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/spark/academic_integrity/index.html

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://ds.info.yorku.ca/>

Counselling & Disability Services at Glendon –

<http://www.glendon.yorku.ca/counselling/personal-counselling/what-is-counselling/>

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

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-andor-harassing-behaviour-in-academic-situations-senate-policy/>