

Department of Biology Course Outline

SC/BIOL 3170 3.00 Population and Community Ecology Fall 2019

Course Description

A comprehensive survey of populations (spatial and temporal patterns of distribution, population growth and regulation, territoriality, life history biology) and communities (community structure, community stability and change, community development, species interactions). Reviews theory, recent research, and applications. Laboratories stress field studies and data analysis. Two lecture hours, three laboratory hours. One term. Three credits.

Prerequisites

SC/BIOL 2060 3.00 and SC/BIOL 2050 4.00

Course Instructors and Contact Information

Instructor / Course Director: Dr Mark Vicari, Room 151A Farquharson Building

- Email: mvicari@yorku.ca. Please include BIOL 3170 in the subject line.
- Office Hours: see Moodle

Teaching Assistants: TBA

Schedule

Lectures: Mondays and Wednesdays, 09:30-10:30 in CB 115

Labs: Mon. or Tues, 14:30-17:30 in Lumbers 131. Three hours in approximately alternate weeks.

Lab Schedule. There are five projects that vary in terms of the amount of field work, the amount of time, and the work to be evaluated:

Week of:

Sept 09 & 16 Lab 1: Population Ecology of the European Land Snail

– Lab report due week of Sept 30 (in lab)

Sept 30 Lab 2: The Goldenrod Gall Co-evolution lab

– Lab writeup due week of Oct 21 (in lab)

Oct 21 Lab 3: SimBio Lab #1 – Liebig's barrel

– Worksheet due week of Nov 4 (in lab)

Nov 4 Lab 4: Investigating Community Structure

– Poster due week of Nov 18 (in lab)

Nov 18 Lab 5: SimBio Lab #2 – Top-down control

– Worksheet due Mon Dec. 2 (in class)

Labs 1 and 2 will require visits to outdoor locations on campus—rain (except thunderstorms) or shine!

Dress with appropriate jackets, jeans, boots etc. In the event of thunderstorms or other severe weather, the labs may be rescheduled for the weeks of Sept. 23 or Oct 7, respectively.

Students purchase the SimBio labs (3 and 5) for a combined fee of \$12 US, using a credit card.

Attendance will be taken at labs and students should be prepared to provide legitimate doctor's notes to explain absences. Students who choose not to attend the data analysis/writing labs (labs between compulsory lab activities) should not expect the TA to provide this information at any other time or by email.

Some work involves groups; it is up to students working in groups to share the workload, meet internal deadlines, and check the quality of each other's work.

Evaluation

Evaluation:

Labs

Snail lab	10%
Goldenrod Lab	10%
SimBio Lab #1	5%
Community Structure Lab	10%
SimBio Lab #2	5%
Midterm Test, Mon. October 28	20%
Exam (Fall exam period, Dec. 5-20)	40%

A penalty of 5% per calendar day will apply to all written material handed in late. After five days, no late work will be accepted.

Important Dates

Midterm test: **Monday Oct 28**

Last date to drop course without receiving a withdrawal note on your transcript: **Friday Nov 8**

Final Exam: to be held during the **fall examination period, Dec. 5-20**. 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: Relyea, R. & Ricklefs, R.E., 2018. *Ecology: The Economy of Nature*, Eighth Edition. W.H. Freeman & Co.

Lab materials: There is no formal lab manual. Handouts for some labs will be available on the Moodle website. Students must also purchase two online labs (\$6 US each) and download them 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/>

Learning Outcomes

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

Area 1. Fundamental Understanding:

Use terminology appropriate to the field of population ecology; Distinguish different models of growth; Recognize the main parameters and major formulae for describing population growth; Derive the formula and employ the formula for mark-recapture analysis; Distinguish between r- and K-selected traits and connect them to life history strategies and growth patterns; Demonstrate a knowledge of the effects of competition on population dynamics; Demonstrate a knowledge of the effects of predation on population dynamics; Demonstrate a knowledge of the effects of parasitism on population dynamics; Demonstrate a knowledge of the effects of mutualism on population dynamics; Apply the principles of population ecology to issues of conservation; Interpret population patterns in terms of evolutionary selective forces and evolutionary mechanisms applicable to small populations; Use natural history knowledge to understand population constraints

Area 2. Critical Thinking Skills

Employ case studies as exemplars of biological concepts; Draw generalized concepts from the results of particular scientific studies or experiments (inductive reasoning); Assess the effectiveness of experimental designs in answering questions about population dynamics; Predict population outcomes of hypothetical changes to the environments of natural populations

Area 3. Problem Solving Skills

Apply principles from the scientific literature to new fact situations; Employ diverse field methods for collecting field data that is sought to address particular biological questions.

Area 4. Effective Communication

On tests and exams, clearly construct written answers to questions and clearly construct written explanations or arguments for scenarios or fact situations; Create a conference-style poster to present a field project; Create and present an audio-visual talk designed to describe a field project

Area 5. Work collaboratively

With partners in collecting field data; with partners in creating and delivering an audio-visual presentation

Course Content

Population Ecology is the study of population dynamics of species, and it focuses on regulation, life history biology, patterns of abundance, and conservation and extinction. Populations make up communities (Community Ecology), and life history traits and evolutionary processes are key factors in populations and communities.

We will consider: Life Histories, Fitness, Population Structure, Population Growth and Regulation, Population Dynamics in space and time, Consumption, Competition, Antagonistic and Mutualistic Co-evolution, Community Structure, Community Development, Behavioural Ecology and Territoriality. Sub-themes may include Population Outbreaks, Dispersal, Sinks and Traps.

Experiential Education and E-Learning

Labs 1 and 2: performing field work; collecting, analyzing and interpreting original data

Labs 3 and 5: exploring concepts in ecology, evolution and experimental design using interactive computer simulations.

Lab 4: performing statistical analysis on an existing data set; interpreting and presenting the results in a conference-style poster presentation.

Course Policies

Email etiquette

Subject line: please begin with "BIOL 3170" 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.

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.pdf

and submit it to the instructor **at least 3 weeks before the date of the test.**

Please read these FAQs!

Can I treat this course as a distance course? It is not designed as a distance course. It is not a course where you have to simply memorize material from a textbook or simply memorize PowerPoint slides! Some of the material will only be delivered during lecture. If you skip class, you will suffer accordingly, but that is up to you.

Then what is "the whole course"? Material delivered during lecture (therefore take notes!), Text readings, Power Point slides posted on-line, and anything else indicated either in-class or on the course website. Then, of course, there are also the labs.

Are study notes posted on-line? Power Point slides used in lecture are posted on-line. Usually I post a pre-lecture version followed by an updated post-lecture version. Remember, these presentations do not constitute the whole course; they need to be understood in conjunction with what is said in class and what is read from the textbook.

Can I surf the web while in class, or text friends, etc.? No! It is rude, and it is distracting to fellow students and to me. There is increasing research it is bad for student performance. Avoid temptation by turning off your phones and wireless. Classes are only 50 minutes, and your undivided attention is helpful to you and to me.

What should I do if I miss a test or lab? Please let me know by email within 24 hours, and submit documentation to the biology online document submission system ASAP:

<http://science.apps01.yorku.ca/machform/view.php?id=84113>

For absences due to illness, an attending physician's statement, filled in and signed by your physician, must be submitted. The form is available for download at

<http://www.registrar.yorku.ca/pdf/attending-physicians-statement.pdf>

Death of an immediate family member requires a death certificate or letter from the funeral director. If acceptable documentation is submitted in a timely fashion, a makeup test will be scheduled in the event of a missed test. Makeup tests may differ in format from the original test (i.e., include more short/long answer questions).

Makeup labs cannot always be granted; where possible, you will be allowed to attend a different lab session.

Do you bump marks at the end of the course? Very rarely; presume that a 79 is a 79, not an 80, and that a 59 is a 59, not a 60! Don't aim for a 49!

Requests for grade changes will be considered only in the event of a recording or marking error. ALL OTHER requests to "bump" grades to the next highest level will be denied.

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.

Numerous students in Faculty of Science courses have been charged with academic misconduct when materials they uploaded to third party repository sites (e.g. Course Hero, One Class, etc.) were taken and used by unknown students in later offerings of the course. The Faculty's Committee on Examinations and Academic Standards (CEAS) found in these cases that the burden of proof in a charge of aiding and abetting had been met, since the uploading students had been found in all cases to be wilfully blind to the reasonable likelihood of supporting plagiarism in this manner. Accordingly, to avoid this risk, students are urged not to upload their work to these sites. Whenever a student submits work obtained through Course Hero or One Class, the submitting student will be charged with plagiarism and the uploading student will be charged with aiding and abetting.

Note also that exams, tests, and other assignments are the copyrighted works of the professor assigning them, whether copyright is overtly claimed or not (i.e. whether the © is used or not). Scanning these documents constitutes copying, which is a breach of Canadian copyright law, and the breach is aggravated when scans are shared or uploaded to third party repository sites.

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.

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-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/>