

****DRAFT SUBJECT TO CHANGE****

Course outline for BIOL*2060

Ecology

Department of Integrative Biology

College of Biological Science

University of Guelph, Fall 2017

I. General Information

This course discusses the ecology of plants, animals, fungi and bacteria as individual organisms, interacting populations, communities and ecosystems. Lectures and discussion groups are used to demonstrate the difficulty of interpreting ecological data derived from field studies. The value of laboratory-based research in ecology will also be discussed. The course will be important for anyone who wishes to understand what we know and need to know about the way ecological systems work.

Offering(s):	Also offered through Distance Education format.
Prerequisite(s):	4.00 credits including BIOL*1070
Department(s):	Department of Integrative Biology

Course Instructors Prof. Christina Caruso
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Tutorial Coordinator Ms. Joyce Buck
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Graduate Teaching Assistants TBA

If you have any questions about the course you should post them in one of the discussions on the Courselink website. Prof. Caruso and Prof. Turetsky will answer questions about lectures (including SimUText and Top Hat) and exams in the Main Class Discussion. Joyce Buck will answer questions about tutorials and writing assignments in the Tutorials and Assignments Discussion. Questions of a personal nature (e.g. illness) should be emailed to the appropriate person, i.e. Prof. Caruso or Prof. Turetsky regarding lectures and exams, and Joyce Buck regarding tutorials and assignments.

Lectures MWF 10:30–11:20 ROZH 101

Tutorials	W 11:30-12:20	SSC 2313
	W 12:30-1:20	SSC 2313
	W 1:30-2:20	SSC 2313
	W 2:30-3:20	SSC 2313
	W 3:30-4:20	SSC 2313
	Th 12:30-1:20	SSC 2313
	Th 1:30-2:20	SSC 2313
	Th 2:30-3:20	SSC 2313
	Th 3:30-4:20	SSC 2313
Midterm exam #1	In class, October 18	
Midterm exam #2	In class, November 20	
Final exam	Date and location TBA	

II. Learning outcomes

By the end of the course the successful student will be able to:

1. Explain patterns observed in nature by applying fundamental ecological theories.
2. Communicate clearly about ecological systems and processes by applying appropriate ecological terminology.
3. Appreciate the historical development of the discipline and the contributions of influential scientists to our understanding of contemporary ecological issues.
4. Begin to formulate solutions to conservation and management issues related to the distribution and abundance of species by applying ecological theory.
5. Navigate spreadsheets, construct appropriate graphs, and interpret results through class discussions and tutorial group work.
6. Find electronically, read for comprehension, and critically analyze primary scientific papers on a specific ecological topic.
7. Critically evaluate primary ecological literature and interpret case studies in the context of ecological theory.
8. Develop and present a research proposal (including a review of literature, statement of hypothesis and predictions, appropriate research methodology, and anticipated results) on an ecological topic.
9. Apply guidelines for citing the primary ecological literature and writing clear, cohesive, and grammatically correct prose.

III. Course Content

There are five major sections in the course:

SECTION I: WHAT IS ECOLOGY?

SECTION II: EFFECT OF THE ABIOTIC ENVIRONMENT ON THE DISTRIBUTION OF ORGANISMS, including climate, biogeography, and adaptation to environmental extremes

SECTION III: EFFECT OF THE BIOTIC AND ABIOTIC ENVIRONMENT ON THE ABUNDANCE OF ORGANISMS, including demography, life history, and population growth

SECTION IV: EFFECT OF SPECIES INTERACTIONS ON THE DISTRIBUTION AND ABUNDANCE OF ORGANISMS, including competition and predation

SECTION V: DETERMINANTS OF COMMUNITY STRUCTURE AND FUNCTION, including succession, top-down vs. bottom-up regulation, and keystone species

Our tentative lecture and reading schedule is as follows:

Date (Instructor)	Lecture Topic	Lecture Reading
Sept-8 (CC/MT)	Introduction to class I. What is ecology?	None
Sept-11 (Guest)	Writing a literature review/research proposal: How to search the primary literature	None
Sept-13 (MT)	II. Effect of the abiotic environment on the distribution of organisms	What causes climate to vary across the globe? Section 4 of Biogeography chapter
Sept-15 (MT)	II. Effect of the abiotic environment on the distribution of organisms	Why do certain biomes occur in certain climates? Section 1 of Physiological Ecology chapter
Sept-18 (MT)	II. Effect of the abiotic environment on the distribution of organisms	Why do different species occur in different climates? Section 2 of Physiological Ecology chapter
Sept-20 (MT)	II. Effect of the abiotic environment on the distribution of organisms	How do organisms maintain their heat balance? Section 3 of Physiological Ecology chapter, p. 1-13
Sept-22 (CMC)	Writing a literature review/research proposal: Discussion of sample student literature reviews	Sample literature reviews (available in the Tutorial Manual)
Sept-25 (MT)	II. Effect of the	How do organisms maintain their water

	abiotic environment on the distribution of organisms	balance? Section 3 of Physiological Ecology chapter, p. 14-23
Sept-27 (MT)	II. Effect of the abiotic environment on the distribution of organisms	Water and heat balance continued
Sept-29	Writing a literature review/research proposal: How to write clear and cohesive prose	Lecture cancelled. Please use the time to work on <i>Hero's Scribe</i> .
Oct-2 (CMC)	III. Effect of the biotic and abiotic environment on the abundance of organisms	What is a life history and how do we quantify variation in life histories? Sections 1 and 2 of Life History chapter
Oct-4 (CMC)	III. Effect of the biotic and abiotic environment on the abundance of organisms	How do we use information on life histories to make qualitative predictions about population growth? Section 3 of Life History chapter
Oct-6 (CMC)	III. Effect of the biotic and abiotic environment on the abundance of organisms	Life histories and qualitative predictions, continued
Oct-9	Thanksgiving	
Oct-11 (CMC)	III. Effect of the biotic and abiotic environment on the abundance of organisms	How do we make quantitative predictions about population growth? Section 2 of Population Growth chapter
Oct-13 (CMC)	III. Effect of the biotic and abiotic environment on the abundance of organisms	Quantitative predictions, continued Section 3 of Population Growth chapter
Oct-16 (CMC)	III. Effect of the biotic and abiotic environment on the abundance of organisms	Quantitative predictions, continued Section 5 of Population Growth chapter
Oct-18	Midterm #1	None
Oct-20 (CMC)	IV. Effect of species	What is competition and how does it affect

	interactions on the distribution and abundance of organisms	population growth? Section 1 of Competition chapter
Oct-23 (CMC)	IV. Effect of species interactions on the distribution and abundance of organisms	How does competition affect species coexistence? Section 3 of Competition chapter, p. 1-15
Oct-25 (CMC)	IV. Effect of species interactions on the distribution and abundance of organisms	How does competition affect species coexistence? Section 3 of Competition chapter, p. 16-26
Oct-27 (CMC)	IV. Effect of species interactions on the distribution and abundance of organisms	How strong is interspecific competition in the field? Section 4 of Competition chapter
Oct-30 (CMC)	Writing a literature review/research proposal: How to design an effective experiment	Understanding Experimental Design chapter, Sections 1 and 2 **Complete Section 1 PRIOR to class, Section 2 AFTER class**
Nov-1 (CMC)	IV. Effect of species interactions on the distribution and abundance of organisms	What is predation and how does it affect population growth? Sections 1 and 2 of Predation, Herbivory, and Parasitism chapter
Nov-3 (CMC)	IV. Effect of species interactions on the distribution and abundance of organisms	What is predation and how does it affect population growth? Section 3 of Predation, Herbivory, and Parasitism chapter
Nov-6 (CMC)	Writing a literature review/research proposal: Discussion of sample student research proposals	Sample research proposals (available in the Tutorial Manual)
Nov-8 (CMC)	IV. Effect of species interactions on the distribution and abundance of organisms	Can predators and prey limit each other's distributions? No reading
Nov-10 (MT)	V. Determinants of	What is a community and how do we quantify

	community structure and function	community structure? No reading
Nov-13 (MT)	V. Determinants of community structure and function	Community structure continued
Nov-15 (MT)	V. Determinants of community structure and function	Why do communities change over time? Section 2 of Community Dynamics chapter
Nov-17 (MT)	V. Determinants of community structure and function	Community change continued
Nov-20	Midterm #2	
Nov-22 (MT)	V. Determinants of community structure and function	Are communities regulated by top-down or bottom-up forces? Sections 3 and 4 of Community Dynamics chapter
Nov-24 (MT)	V. Determinants of community structure and function	Top-down or bottom-up continued
Nov-27 (MT)	V. Determinants of community structure and function	What stabilizes communities? Section 5 of Community Dynamics chapter
Nov-29 (MT)	V. Determinants of community structure and function	What stabilizes communities continued
Dec-1 (MT)	TBA	

General information on lectures

-For your convenience, drafts of slides will be posted on both Courselink and Top Hat prior to lecture. However, please note that these drafts can differ from the final, corrected versions of the slides, which will be posted on Courselink and Top Hat after lecture.

-I will often ask you to confer with your neighbors during lecture. I do this because research shows that students who work with their neighbors to answer questions in class score better on exams than students who do not interact with their peers.

Our schedule of tutorials is as follows:

Week	Tutorial Topic
Tutorial 1	Choosing a topic & finding journal articles
Tutorial 2	Reading scientific journal articles
Tutorial 3	Writing a literature review
Tutorial 4	Observations to experimental design
Tutorial 5	Creating effective figures using Excel
Tutorial 6	Writing a research proposal

Tutorial 7	Research question to experimental design
Tutorial 8	Expected results & significance
Tutorial 9	Assignment 2 help session

Each student will be assigned to a tutorial group with three other students and will remain with that group for the semester. There will be nine tutorials during the semester, and you are expected to attend them all. Each tutorial will include some or all of the following activities: i) advance preparation on an individual basis, ii) a small group discussion to answer a series of questions on a worksheet, with TA assistance, and iii) submission of the completed worksheet(s).

Materials for each tutorial session will be available in the Tutorial Manual. Be sure to complete any assigned activities in advance of the tutorial so that you are prepared and ready to contribute to your group!

IV. Course Resources

SimUText Ecology Electronic ‘Textbook’ Software

We will be using interactive software called SimUText Ecology for BIOL*2060. This software is **required**, but is much less expensive than a traditional textbook, and is yours to keep for life. SimUText Ecology must be purchased with a credit card and can be downloaded onto your computer. It utilizes text, videos, and interactive simulations to allow you to practice working with concepts we discuss in lecture. Sections of eight SimUText Ecology chapters are assigned:

- SECTION II: **Biogeography**
Physiological Ecology
- SECTION III: **Life History**
Population Growth
- SECTION IV: **Competition**
Predation, Herbivory and Parasitism
- SECTION V: **Community Dynamics**
- Tutorial: **Understanding Experimental Design**

As you read SimUText, you will have the option to submit your responses to questions. **The answers to these questions will be released to provide you with feedback on your comprehension of course material, but they will not be used to calculate your grade for the course. However, a subset of the questions will appear on the exams, so you would be wise to answer them!**

*****The instructions for purchasing SimUText will be posted on the Biol 2060 Course link site.*****

Top Hat

To facilitate interactions and discussions in and out of lecture, we will be using Top Hat. Top Hat software allows you to answer questions from your smartphone, tablet, or laptop. We will begin the graded Top Hat questions on September 19th. Marks will be assigned for participation, with full credit being given for participating in 85% of the Top Hat questions for the semester. You will be able to review the questions that you answered on Top Hat, and your marks will be uploaded to the Courselink gradebook at the end of the semester (see **V. Methods of assessment**, below, for more details).

******You will receive an email with instructions for purchasing Top Hat.******

Tutorial Manual

The BIOL*2060 Tutorial Manual (white cover/Forest) is required for the course and will be available for sale for \$15.00. Dates and times that they will be sold will be posted on the course website and in the Science Complex. Please bring your Tutorial Manual with you to every tutorial.

Spreadsheet and Word Processing Software

The assignments will involve creating effective figures and writing reports. You will need access to spreadsheet and word processing software that is compatible with Microsoft Word and Excel. These programs are available to download for free from the Computing and Communication Services (CCS) website. They are also installed on the laptops available at the University of Guelph Library and on the desktops in the CBS computer laboratories.

V. Methods of assessment

Assessment		Due Date
Tutorial Worksheets	10%	8 of 10 weeks (Learning outcomes #5, 6, 7)
Assignment 1	10%	October 12 (Learning outcomes #6, 7, 9)
Midterm Exam #1	10%	October 18 (Learning outcomes #1, 2, 3, 4, 5, 7)
Assignment 2	20%	November 16 (Learning outcomes #1, 2, 6, 7, 8, 9)
Midterm Exam #2	15%	November 20 (Learning outcomes #1, 2, 3, 4, 5, 7)
Top Hat Questions	2%	All semester (Learning outcomes #1, 2, 3, 4, 5, 7)
<i>Scribe's Hero</i> game	3%	October 6 (Learning outcome #9)
Final Exam	30%	TBA (Learning outcomes #1, 2, 3, 4, 5, 7)

Tutorial Worksheets

Weekly tutorials will take you step by step through the skills needed to complete the two assignments.

Tutorial Worksheets 1, 2, and 4 will be completed as a group, and all members in your group who participated will get the same grade. Tutorial Worksheets 3, 5, 6, 7, and 8 will be completed on an individual basis in advance of the tutorial, and they will be discussed and submitted individually. Each tutorial worksheet will be worth 1.25% of your grade for the semester. Questions about tutorial grades must be emailed to Joyce Buck within one week of the return of the Tutorial Worksheet.

Assignments

The assignments will allow you to explore how science is done, including searching for primary research journal articles using online databases, summarizing and critically evaluating journal articles in a literature review, and writing a research proposal.

Top Hat Questions

Top Hat will be used to test your comprehension of the assigned readings, stimulate participation in class discussions, and enhance your understanding of course content.

Scribe's Hero

Scribe's Hero, an online game developed by UG Writing Services, will be used to help you remember and/or learn the professional writing skills needed to complete the assignments.

Midterms and Final Exam

The exams will include a selection of multiple choice and (on the final) short answer questions based on all material presented and discussed in lectures, tutorials, assignments, and the assigned portions of the SimUText Ecology chapters. The emphasis of these questions is on comprehension and application of knowledge, not regurgitation of memorized facts. Students are advised to discipline themselves to stay on top of the course material so as to be best prepared for the exams. The questions discussed in lecture will be similar to the kinds of questions that will appear on exams.

VI. Course Policies

Academic Consideration

If you are unable to complete any of the Writing Assignments by the deadline for documented medical, psychological, or compassionate reasons, please contact Joyce Buck in advance of the deadline to make arrangements for a short extension.

If you are sick or otherwise unable to attend a tutorial for a valid medical, psychological or compassionate reason, please contact Joyce Buck by email in advance. You may be able to

attend a different tutorial section that week or complete the work on an individual basis. If so, be sure to add your regular tutorial day and time beside your name on the Tutorial Worksheet so that you can get credit for your work.

If you are absent for a midterm exam for documented medical, psychological, or compassionate reasons, you should contact your program counsellor within five working days of the missed exam and seek academic consideration. Students who miss a midterm exam for documented reasons will have the final exam reweighted.

See the undergraduate calendar for information on regulations and procedures for Academic Consideration:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Academic Integrity

You are encouraged to discuss the course with your peers, but all work for the Writing Assignments **MUST** be your own.

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning

environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services as soon as possible. For more information, contact SAS at 519-824-4120 ext. 56208, email sas@uoguelph.ca, or see the website:

<http://www.uoguelph.ca/csd/>

Assignment of Grades

Assignments will be marked on the basis of the criteria outlined in the Undergraduate Calendar. Clarification about the assignment of grades can be found under Grading Procedures at:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-grds-proc.shtml>

Copies of Writing Assignments

Keep paper and/or other reliable back-up copies of all your writing assignments, as you may be asked to resubmit work at any time.

Course Evaluation Information

CCS now provides the U of G Course Evaluation System in a secure, online environment. End of semester course and instructor evaluations provide students the opportunity to have their comments and opinions form part of the information used by Promotion and Tenure Committees in evaluating the faculty member's contributions in the area of teaching.

Course evaluations are now conducted through this web site. Login with your central email account login ID and password:

https://courseeval.uoguelph.ca/CEVAL_LOGIN.php

Instructors do NOT receive evaluations until the end of exam period. Furthermore, evaluations are anonymous, unless you specifically indicate you want to acknowledge your comments.

Drop Date

The last date to drop one-semester courses, without academic penalty, for Fall 2017 is November 3rd. For regulations and procedures for dropping courses, see the Undergraduate Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

E-mail Communication

As per university regulations, all students are required to check their <username@mail.uoguelph.ca> e-mail account regularly. E-mail is the official route of communication between the University and its students.

Recording of Materials

Presentations which are made in relation to course work—including lectures and tutorials—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Re-grading of Assignments

If you wish to have an assignment re-graded, then you should email Joyce Buck. All requests for re-grading **MUST** be made within one week of the return of the assignment. Be aware that the entire document will be re-graded, which could result in an increase, decrease, or no change to your mark.

Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs: <http://www.uoguelph.ca/registrar/calendars/index.cfm?index>.

Student Responsibilities

You should plan on spending a minimum of ten hours per week working on this course, in addition to time spent in lectures and tutorials. This time includes reading the required sections of the electronic textbook, reviewing and/or rewriting lecture notes, preparing questions on any material with which you need help, preparing for the tutorials, and working on your writing assignments. The Instructors, Tutorial Coordinator, and TAs will offer as much assistance as possible. However, remember that this is your learning experience, and you will get as much out of this class as you put into it.

Submission of Assignments and Late Policies

Weekly Tutorial Worksheets must be submitted by 11:45 pm on your tutorial day to the Dropbox. There will be a 14-minute grace period, however late submissions will **NOT** be accepted.

The two Writing Assignments should be saved in Word (.doc file format compatibility mode) and submitted electronically in the correct folder on the Dropbox page in D2L by 11:45 pm on the due date. There will be a 14-minute grace period to take into

consideration any delays due to occasional slowdowns experienced by the system accepting the submissions. Late submissions will be accepted for up to 24 hours after the assignment deadline with a 10% late penalty. If you encounter technical problems when submitting your writing assignments, please email the assignment to Joyce Buck in advance of the deadline to avoid late penalties.

Please be sure to follow the guidelines in the Submission of Assignments Checklist in order to avoid common problems that could cost you marks.

Submission of Assignments Checklist

- Have I got a back-up copy of my assignment saved on a USB key or in the cloud?
- Is my work complete? Have all required elements been included?
- Have I used the appropriate Submission Form? (No cover page is required.)
- Have I saved my file in Word (.doc file format compatibility mode)?
- Have I named my file with my surname, given name, and assignment number, e.g. "Buck Joyce Assignment 1.doc"?
- Have I submitted my file in the correct folder on the Dropbox page?
- Have I submitted the correct file? **Hint:** You can download the file after it has been submitted to double-check for empty files, incomplete files, or incorrect files.
- Have I submitted it well in advance of the 11:45 pm deadline to avoid late penalties? **Hint:** If you are still working on the assignment close to the deadline, you should submit one copy before 11:15 pm and then re-submit closer to the deadline. We will grade the version that is submitted closest to the deadline.
- Have I received a Dropbox Submission Receipt by email? **Note:** You should retain this email in case it is needed to verify that your submission was received. If you don't get a Submission Receipt then your submission has not been successful and you should try again.
- Have I checked my email the day following an assignment due date? **Note:** If we haven't received your submission on the day that your assignment is due, we will send you a "Courtesy Notice" to your U of Guelph email address the next day asking you to submit it by 11:45 pm that night for a 10% late penalty.

VII. Campus Resources

If you are concerned about any aspect of your academic program:

- make an appointment with a program counsellor in your degree program.
<http://www.bsc.uoguelph.ca/index.shtml> or
<https://www.uoguelph.ca/uaic/programcounsellors>

If you are struggling to succeed academically:

- There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general

study skills. You can also set up individualized appointments with a learning specialist. <http://www.learningcommons.uoguelph.ca/>

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. <https://www.uoguelph.ca/counselling/>
- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. <http://www.uoguelph.ca/~ksomers/>

If you have a documented disability or think you may have a disability:

- Student Accessibility Services (SAS) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability. For more information, including how to register with the centre please see: <https://www.uoguelph.ca/csd/>

VII. Additional Course Information

We expect you to

- take responsibility for your own learning
- prepare for and attend class and tutorials regularly
- participate enthusiastically in class activities and tutorials
- set high standards for your performance in the course
- treat others in the course respectfully
- turn in work on time
- stay informed about course information distributed online
- maintain academic integrity

You can expect us to

- help you become a better learner
- create interesting and challenging ways for you to learn about ecology
- set high standards for the class
- treat you with fairness and respect
- promptly respond to your questions and concerns about the course
- take an interest in your development as a biologist
- be excited and knowledgeable about the course material
- grade and hand back your work promptly