

Welcome to BIOL 470-A03 – Spring 2015 – Advanced Ecology

Lectures: Tu, W, Fr 10:30-11:20am

Location: CLE D125

Tutorials: M 2:30-3:30pm CLE A108

(register for BIO 470 T05 crn 20340)

Pre-requisite: BIOL 215 Pre- or co-requisite: BIOL 330 or ES 344

Instructor: Dr. Julia K. Baum

Email: baum@uvic.ca

Office hours: F 11:30am – 12:30pm

Petch 116 or by appointment

TA: James Robinson, jamespwr@uvic.ca

Course Rationale and Format

The overarching goals of this course are twofold: 1) to broaden and deepen your understanding of the field of ecology, 2) to develop skills you need in order to become an independent scientist.

Among these skills are:

- Understanding the process of scientific research and discovery. This involves developing your abilities in critical thinking and hypothesis testing;
- Learning to read and critically evaluate scientific papers;
- Communicating your ideas about science clearly, both orally and in writing
- Programming and modeling skills to analyze scientific data

The course emphasis will be on community and ecosystem ecology, although we will cover some basic population models in tutorials. Each week we will focus on a different theme and follow the format:

- Skill-building tutorial (Monday)
- Lecture (Tuesday)
- Discussion of related papers (Wednesday)
- Student presentation and moderated discussion of related papers (Friday)

Lectures: Lectures will provide an overview of the theme, including its conception, theoretical underpinnings, and development within the field of ecology.

Discussions: A major component of this course will involve reading, critiquing, and discussing the primary literature in the field of ecology. On Wednesdays, we will typically discuss two papers, a classic one and a recent one, both related to that week's theme. I will lead the first two weeks of discussion. Thereafter, two students will lead and moderate each Wed.'s discussion, with each student responsible for one of the papers. You will sign up for a discussion week at the beginning of our second class. As discussion co-leader and co-moderator, you will first present a brief overview of the paper, including the major question(s) it examines, hypotheses being tested, main findings, and why it is interesting. This should only take about 5 minutes (we will all have read the papers). Your overview is not a formal presentation or lecture, thus you cannot use powerpoint, but you may draw on the chalkboard if you like. Then proceed to your list of insightful and stimulating discussion questions. These should be open-ended to stimulate discussion and may include things like whether the methods adequately address the hypotheses, what caveats the authors should have considered, and whether the results or interpretations are supported by the data. Total discussion time for the two papers will be 45-50 minutes. That isn't very long, so moderators will need to think carefully about what the major concepts of the papers and what the class should discuss. I encourage moderators to use the lecture material as a jumping-off point and to work together to decide how to allocate time. We will cover how to lead a discussion in Skills Tutorial 2. You also will be assigned a paper to read for each Friday's class, and a short discussion of this paper will follow the student presentations (below).

Presentations: Beginning in week 3, two students will present a 25-30 minute presentation together each Fri. on a topic related to that week's theme, followed by a short moderated discussion. You will sign up for a presentation week at the beginning of our second class, and work together with your partner to decide on a topic and to develop your presentation. The presentation should present discoveries from 1-3 recent papers, and may focus on an emerging research area related to the theme, an area of controversy related to the theme, or an aspect of the theme not covered earlier in the week. In addition to developing your presentation, you will assign 1 paper (which you will cover in your presentation) for the class to read in advance of class. Following your presentation, you will use the rest of the class time to moderate a class discussion on your presentation topic and the assigned paper. Presentation topics and papers must be discussed with, and approved by, me at least two Fridays prior to your presentation. The assigned paper for the class must be posted the Fri. prior to your presentation.

Skill-building tutorial: Each week, we will also meet for a one-hour skill building tutorial. The aim of these tutorials is to enhance skills that are critical for ecologists: written and oral communication skills, quantitative and programming skills.

Participation: Participation will be evaluated based upon how well you communicate your insights and understanding of the ecological theme, and specifically the assigned readings. Short writing assignments based upon the readings may be assigned during the semester to facilitate discussion.

Review Paper: Each student will write a review paper (10 pages double spaced maximum, not including references) on an ecological topic of interest. Examples include: What is the history of the diversity-stability debate and where does it stand now? What is the evidence for top-down control versus bottom-up control in marine ecosystems relative to terrestrial ecosystems? What do we know about the ecological impacts of climate change, and how can we improve understanding of these effects? Topics must be approved by me by Friday January 30th at the latest. Each of you will also review a draft of one of your classmate's papers and provide critical feedback to your classmate with the aim of helping them to improve their final review paper. Drafts will be due to each other on Wed. March 18th, and the feedback will be due on Wed. March 25th. Final versions of your review paper are due by 4pm on Wed. April 1st.

Course Evaluation

Class Contributions

General Participation – Discussion and short writing pieces	15%
Discussion Moderation	10%
Formal presentation and discussion moderation	25%

Skills Tutorial Assignments:

A1 – Quantitative Models in R	10%
A2 – Quantitative Models in R	10%

Review Paper

Draft	4%
Peer-review	6%
Final paper	20%

Grading Scale: Final grades will be assigned on the basis of the official UVic grading scale: <http://web.uvic.ca/calendar2014-09/GRAD/FARe/Grad.html>

Course Materials & Communication

Required Readings: There is no required text for this course. Several ecological textbooks will be available for you to use as reference material.

Course Website: <http://uvic470ecology.weebly.com/> I will post all course announcements, readings, assignments, and the weekly lecture schedule on our course website. I will also post lecture slides *after* lectures. Please be aware that these are overviews, not detailed notes, and are provided to help you organize and supplement your lecture notes. It is **your responsibility to check our course website each week for updates.**

Email: If you have any questions or concerns with the course or your assignments, please feel free to meet me during office hours or by appointment, or contact me via email using your UVic email. Emails from other accounts (e.g. gmail) may be treated as spam and may not reach me. Please treat your email to me as a professional correspondence: use a formal salutation as well as correct grammar and spelling, include 'BIOL 470' and the nature of your query (e.g. Question re: Assignment 1) in the subject line, and your full name and student number within the body of the email. If arranging an appointment, please explain the reason for the appointment and list 3-4 times when you are available so that I can find a time that fits my schedule. I will do my best to respond to emails in a timely fashion, but please understand that delays may occur. Therefore, be prepared to wait up to 48 hours for a response during the week, and do not wait to email with queries about assignments at the last minute! Email will only be checked sporadically on weekends, and thus will not typically be answered until Monday.

Instructor Expectations & Student Responsibilities

This course will only fulfill the learning outcomes outlined above if you commit:

1. **To reading the assigned materials prior to class.** The assigned readings will provide us with the common ground for lectures and discussions, and a substantial proportion of your mark will be based on your oral and written communication of your understanding of the assigned material. Therefore, you will have to have read, comprehended, and made notes on the assigned readings prior to class to success in this class. A general rule of thumb is to plan to spend at least 5 hours a week reading and reviewing lectures notes and preparing for Wednesday and Friday discussions. All readings will be assigned and posted at least three days prior to the lecture in which they will be discussed.
2. **To attending class, and being prepared for and engaged in class.** Both you (the student) and I (the instructor) have a responsibility to come to class, to be on time, to be prepared to discuss the subject area, and to create a positive, constructive and respectful learning environment for others in the class. This includes turning cell phones off, not using electronic devices for activities unrelated to the class, and not leaving class early. This course will include lectures, as well as individual, pair, and small group activities, and discussions of assigned readings, all of which will be most successful if we all meet these responsibilities. You should also take notes throughout class, and later use the lecture overview slides to supplement your notes. This, in addition to doing the assigned readings (as described above) will help prepare you for W and F classes.
3. **To being an active participant in your learning.** Learning requires effort on both your and my parts. For you to succeed in this course, you must apply yourself to the best of your ability: think logically and critically, challenge yourself, and try to synthesize seemingly disparate concepts and facts. Finally, consult with me when additional help is required. I am here to facilitate your learning.

UVic Policies and Procedures

Evaluation Policies: UVic accepts three types of excuses for late assignments: illness, emotional trauma, UVic-sponsored sporting activities. Requests for academic concession must be accompanied by valid written documentation from a medical doctor, UVic Counseling services, or a member of the UVic coaching staff.

Academic Integrity: I expect that all work you produce for this course will be your own, and I have zero tolerance for plagiarism of any form. Any words or ideas that are not your own MUST be acknowledged. Plagiarism includes “recycling” work from other classes, and it includes copying from online sources. It is your responsibility to familiarize yourself with UVic’s Academic Integrity Policy: <http://web.uvic.ca/calendar2011/FACS/UnIn/UARe/PoAcI.html> and the library’s website on plagiarism: <http://library.uvic.ca/site/lib/instruction/cite/plagiarism.html> for the university policy on academic integrity and useful information on avoiding plagiarism. Any form of academic dishonesty will result in an automatic ‘F’ for that assignment and possibly the entire course for all individuals involved.

Course Registration: It is your responsibility to attend to ADD/DROP dates published in the Calendar and posted on the Undergraduate Records website. You must not assume you will be dropped automatically from a course simply because you do not attend class. It is your responsibility to check your records and registration status, and to read the appropriate section of the current UVic Academic Calendar regarding your rights and obligations.

Accessibility: Students with diverse learning styles and needs are welcome in this course. If you have a disability/health consideration that may require accommodation to ensure that you succeed in this course, please talk to me (or staff at the UVic Resource Centre for Students with a Disability) as soon as possible. The RCSD staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations <http://rcsd.uvic.ca/>. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Positivity and Safety: UVic is committed to promoting, providing and protecting a supportive and safe learning and working environment for all its members.

Course Week-by-Week Overview

Week	Date	Weekly Theme and Class Format*	Skills Tutorial*
1		ECOLOGICAL AIMS AND APPROACHES	
	T Jan 6	L: Course Overview	
	W Jan 7	L: What is ecology? Major areas of inquiry and approaches	
	F Jan 9	D: How are ecological discoveries made?	
2		SCALE	How to read a scientific paper and think critically
	T Jan 13	L: The importance of scale in ecology	
	W Jan 14	D: Microcosms in ecology	
	F Jan 16	L or D: tbd	
3		BIODIVERSITY	How to moderate a discussion and give an effective presentation
	T Jan 20	L: Biodiversity: types, patterns, and causes	
	W Jan 21	D First student led discussion:	
	F Jan 23	P First student presentation: β diversity or functional diversity	
4		DIVERSITY-STABILITY	Getting started in R - Part 1 Data types and importation
	T Jan 27	L: Diversity-stability	
	W Jan 28	D: Diversity-stability	
	F Jan 30	P: Portfolio effects	
5		BIODIVERSITY-ECOSYSTEM FUNCTION	Getting started in R - Part 2 Data manipulation
	T Feb 3	L: Biodiversity-Ecosystem function	
	W Feb 4	D: Biodiversity-Ecosystem function	
	F Feb 6	P: Biodiversity-Ecosystem function	
6		SPECIES INTERACTIONS	Getting started in R - Part 3 Plotting
	T Feb 17	L: Predator-prey interactions	
	W Feb 18	D: Predator-prey interactions	
	F Feb 20	P: Competition, mutualisms or facilitation	
7		TROPHIC INTERACTIONS & FOOD WEB ECOLOGY	Population models in R
	T Feb 24	L: Food chains and food webs, top down vs. bottom up control	
	W Feb 25	D: Food chains and food webs, trophic cascades	
	F Feb 27	P: Trophic cascades and/or mesopredator release	
8		FOOD WEBS and ECOLOGICAL NETWORKS	Population models in R
	T Mar 3	L: Food webs and network models	
	W Mar 4	D: Ecological networks	
	F Mar 6	P:	
9		MACROECOLOGY	Population models in R
	T Mar 10	L: The macroecological approach and major patterns	
	W Mar 11	D:	
	F Mar 13	P:	
10		METABOLIC THEORY or RESILIENCE	How to write a paper
	T Mar 17	L:	
	W Mar 18	D:	
	F Mar 20	P:	
11		ECOLOGICAL IMPLICATIONS of CLIMATE CHANGE	Feedback on draft papers
	T Mar 24	L: Ecological implications of climate change	
	W Mar 25	D:	
	F Mar 27	P:	
12		THE FUTURE of ECOLOGY	How to be a professional ecologist
	T Mar 31	L: The future of ecology / jobs in ecology	
	W April 1	L: Jobs in ecology	

*Subject to modification as we progress. Specific readings and tutorial materials will be posted on course website.

L=lecture, D=discussion, P=student presentation