

Welcome to BIOL 462 – Spring 2022 – Community & Ecosystem Ecology

Lectures: Tu, W, Fr 10:30-11:20am
Location: CUNN 146
Tutorials: None

Instructor: Dr. Amanda Bates
Email: amandabates@uvic.ca
Office hours: by appointment/Zoom
Co-Instructor: Dr. Joan Alfaro
Supplementary Instructor: Megan Davies

~Thanks to Dr. Julia Baum for sharing course material included herein.

• Course Rationale and Format

The overarching goals of this course are: 1) to broaden and deepen your understanding of the field of community ecology, 2) to develop skills you need in order to become an independent scientist, and 3) consider modern approaches for community ecology and conservation.

Among these skills are:

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

Each week we will focus on a different community/ecosystem ecology theme and follow the format:

- Lecture
- Discussion of related papers
- Lecture or Working Group activity

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 a review or synthesis paper, which relate to that week's theme and will involve a small in-class assignment. Each group will lead and moderate one paper. You will sign up for a discussion week by going to "groups" in Brightspace. The deadline is Wednesday following our second class (if you do not you will be automatically enrolled in a week). As paper co-leader, you will first present a brief overview of the paper, such as the major question(s) it examines, main findings, and why it is interesting (Megan will provide an example of a presentation in Week 2 of our course). The presentation should only about 5 minutes and you can use powerpoint if you wish. Each team will use techniques to facilitate quality discussion/debate or learning across a diverse group of participants. The follow-up discussion/activity session will aim to identify, for example, the strengths and weakness of the paper, bring the work into broader context, or identify key next steps. A well-executed discussion/activity session will engage the diverse expertise and interests of the full group. In the past activities have been diverse, so please use your imagination.

Quantitative model and report: You will be given the task of using data from the literature to parameterize a Leslie Matrix Model and project population change for a species of your choice, accompanied by a formal write-up. Changes in keystone and fundamental species populations can lead to large-scale ecosystem shifts.

Take-home final project: You will be given the task of producing a monitoring protocol for Mystic Vale which will be practical and require application of the knowledge you gained in the course. The format, style, and selection of key components will be up to you to decide upon and design.

Participation: Participation will be evaluated based upon how well you communicate your insights and understanding of the ecological themes, whether you are a team player, and your overall engagement in the class.

- **Course Evaluation**

Class Contributions

General participation	5%
Discussion assignment participation (10 sessions, 2% per session)	20%
Formal presentation, discussion and activity design	10%

Assignments:

Quantitative model and report	30%
Take home final project (Monitoring protocol)	35%

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**

Additional Readings: There is no required text for this course. Several ecological textbooks are applicable as support for some lectures, and will be referenced accordingly. Some suggested papers which complement each week's themes have been added to our course Brightspace content in a folder labelled "Additional Readings".

Course Content: I will post all course announcements, readings, assignments, and the weekly lectures schedule on our Brightspace account through the UVic portal. 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.

- **Instructor Expectations & Student Responsibilities**

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

1. **To read the assigned papers prior to Wednesday's discussion class.** The assigned readings will provide us with the common ground for discussions, and a substantial proportion of your mark will be based on your oral and written communication of your understanding of the assigned material.
2. **To attend class, and be 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.

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/PoAcl.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. Please see the UVic student code of conduct - <https://www.uvic.ca/services/advising/advice-support/academic-units/student-code-of-conduct/index.php>.

- **Course Week-by-Week Overview**

Week	Date	Weekly Theme and Class Format*
1	T Jan 10	ECOLOGICAL AIMS AND APPROACHES Lecture: Introductions and course overview (Amanda, Joan, Megan)
	W Jan 11	Discussion: <i>Promoting inclusive metrics of success and impact to dismantle a discriminatory reward system in science</i> (Davies et al 2021) (Joan, Megan)
	F Jan 13	Lecture: What is ecology? (Joan)
2		SCALE AND MONITORING
	T Jan 17	4. Lecture: The importance of scale in ecology (Joan)
	W Jan 18	5. Discussion: <i>The science and application of ecological monitoring</i> (Lindenmayer & Likens, 2010) (Megan)
	F Jan 20	6. Field trip: <i>Mystic vale: setting up a long-term monitoring plot (walk in the woods)</i> (Joan, Megan)
3		MATRIX MODELS
	T Jan 24	Lecture: Models in ecology (Amanda)
	W Jan 25	Discussion: <i>Do simple models lead to generality in ecology?</i> (Srivastava et al 2000) (Amanda)
	F Jan 27	Lecture: Matrix models in ecology (Amanda)
4		SPECIES INTERACTIONS
	T Jan 31	Tutorial: Building a matrix model, species interactions, and available data sets (Amanda)
	W Feb 1	Discussion: <i>How context dependent are species interactions?</i> (Chamberlain et al 2014) (Amanda)
	F Feb 3	Lecture: Communities: Species interactions (Amanda)
5		BIODIVERSITY- ECOSYSTEM FUNCTION
	T Feb 7	Lecture: Community assembly and biodiversity patterns (Amanda, *recorded)
	W Feb 8	Discussion: <i>Scaling-up biodiversity-ecosystem functioning research</i> (Gonzalez et al 2019) (TBD)
	F Feb 10	***Due: Quantitative matrix data set and model (10%)
6		BIODIVERSITY-STABILTIY
	T Feb 14	Lecture: Biodiversity: types, patterns, and causes (Amanda)
	W Feb 15	Discussion: <i>The diversity-stability debate</i> (McCann 2000) (Amanda)
	F Feb 17	Lecture: Biodiversity-stability relationships (Amanda)
		READING WEEK
7		TROPHIC INTERACTIONS & FOOD WEB ECOLOGY
	T Feb 28	L12: Food webs and trophic cascades (Amanda)
	W Mar 1	D: <i>Trophic downgrading of planet Earth</i> (Estes et al 2011) (Amanda)
	F Mar 3	Tutorial: Building your CV (Amanda) ***Due: Quantitative matrix paper (20%)
8		FOOD WEBS & ECOLOGICAL NETWORKS
	T Mar 7	L14: Food webs and ecological networks (Amanda)
	W Mar 8	D: <i>Ecological networks – beyond food webs</i> (Ings et al 2009) (Amanda)
	F Mar 10	Working group: Monitoring project (Amanda)

9		MACROECOLOGY
	T Mar 14	Lecture: Macroecological approaches and patterns (Amanda)
	W Mar 15	Discussion: <i>Towards a macroscope: leveraging technology to transform the breadth, scale and resolution of macroecological data</i> (Dornelas et al 2019) (Amanda)
	F Mar 17	Lecture: Global analyses, data challenges and glimmers of hope (Amanda)
10		BIODIVERSITY CONSERVATION & RESILIENCE
	T Mar 21	Lecture: Resilience and conservation in ecology (Amanda)
	W Mar 22	Discussion: <i>Biodiversity and resilience of ecosystem functions</i> (Oliver et al 2015) (Amanda)
	F Mar 24	Working group: Monitoring project (Amanda)
11		GLOBAL CHANGE
	T Mar 28	Lecture: Altered baselines and what can we learn (Amanda)
	W Mar 29	Discussion: <i>Predator recovery, shifting baselines, and the adaptive management challenges they create</i> (Cammen et al 2019) (Amanda)
	F Mar 31	Tutorial: Interviewing skills (Amanda)
12	W Apr 5	***Due: Monitoring protocol project write-up (35%)

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