

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

Lectures: Tu, W, Fr 10:30-11:20am
Location: MacLaurin Building D101
Tutorials: ***

Instructor: Dr. Amanda Bates
Email: amandabates@uvic.ca
Office hours: by appointment/Zoom

***due to scheduling issues, we will have to find one session that suits everyone's time schedule

~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.

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;
- Quantitative skills

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

- Lecture (Tuesday)
- Discussion of related papers (Wednesday)
- Lecture (Friday)
- Skill-building tutorial (Friday or as scheduled based on availability)

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 a Wed discussion. 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 5-8 minutes (we will all have read the papers) and your job is highlighting the main take-home messages. Your overview is not a formal presentation or lecture, thus you cannot use powerpoint, but you may draw on the online/in-class whiteboard if you like. 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.

Tutorials: Each week, beginning the week starting January 25th, we will also meet for a 50 minute skill-building, thought provoking, or feedback tutorial. The aim of these tutorials is to provide additional support for your assignments and to enhance skills that are critical for ecologists to gain a job and thrive in STEMM.

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 exam: You will be given five open-ended exam questions which will be practical and require application of the knowledge you gained in the course.

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%
Inclass Presentation/discussion assignments (10 sessions, 2% per session)	20%
Formal presentation/discussion moderation	10%

Skills Tutorial Assignments:

Quantitative model and report	30%
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Exam

Take home	35%
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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. Please treat your email to me as a professional correspondence.

- **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*	Tutorial*
1	T Jan 11	ECOLOGICAL AIMS AND APPROACHES L&D: Introductions and course overview (online)	***None 1st wk
	W Jan 12	L&D: <i>Strategies for reading papers</i> (online)	
	F Jan 14	L1: What is ecology? (online)	
2	T Jan 18	SCALE L2: The importance of scale in ecology (online)	***None 2nd wk
	W Jan 19	D: <i>Spatial scaling in ecology</i> (Wiens 1989)	
	F Jan 21	L3: Scale and variability in ecology (online)	
3	T Jan 25	MATRIX MODELS L4: Models in ecology	Building a matrix model
	W Jan 26	D: <i>Are natural microcosms useful model systems for ecology?</i> (Srivastava et al 2000)	
	F Jan 28	L5: Matrix models in ecology	
4	T Feb 1	SPECIES INTERACTIONS L6: Communities: predator-prey	Matrix model feedback
	W Feb 2	D: <i>The evolution of species interactions</i> (Thompson et al 1999)	
	F Feb 4	L7: Communities: other species interactions	
5	T Feb 8	BIODIVERSITY- ECOSYSTEM FUNCTION L8: Community assembly and biodiversity patterns	Matrix model feedback
	W Feb 9	D: <i>Community assembly & functions of the coral skeleton microbiome</i> (Ricci et al 2019)	
	F Feb 11	L9: Quantifying biodiversity patterns and functions	
6	T Feb 15	BIODIVERSITY-STABILITY L10: Biodiversity: types, patterns, and causes	Tips for writing papers
	W Feb 16	D: <i>The diversity-stability debate</i> (McCann 2000)	
	F Feb 18	L11: Biodiversity-stability relationships	
READING WEEK			
7		TROPHIC INTERACTIONS & FOOD WEB ECOLOGY	***None 7th wk ***Report Due
	T Mar 1	L12: Food webs: top down vs. bottom up control	
	W Mar 2	D: <i>Trophic downgrading of planet Earth</i> (Estes et al 2011)	
	F Mar 4	L3: Trophic cascades	
8		FOOD WEBS & ECOLOGICAL NETWORKS	How to develop a CV
	T Mar 8	L14: Food webs and ecological networks	
	W Mar 9	D: <i>Ecological networks – beyond food webs</i> (Ings et al 2009)	

9	T Mar 15	MACROECOLOGY L16: Macroecological approaches and patterns	
	W Mar 16	D: <i>Towards a macroscope: leveraging technology to transform the breadth, scale and resolution of macroecological data</i> (Dornelas et al 2019)	How to ace an interview
	F Mar 18	L17: Global analyses and data challenges	
10	T Mar 22	BIODIVERSITY CONSERVATION & RESILIENCE L18: Resilience & Conservation	Jobs in ecology
	W Mar 23	D: <i>Biodiversity and Resilience of Ecosystem Functions</i> (Oliver et al 2015)	
	F Mar 25	L19: Climate Resilience and the Protection Paradox*	
11	T Mar 29	GLOBAL CHANGE L20: Altered baselines and what can we learn	
	W Mar 30	D: <i>Shifting baselines, local impacts, and global change on coral reefs</i> (Knowlton & Jackson 2008)	***None 11th wk
	F Apr 1	L21: The future of ecology / jobs in ecology	
12	T Apr 4	EXAM PREP Take-home exam distribution	
	W Apr 5	D: <i>Promoting inclusive metrics of success and impact to dismantle a discriminatory reward system in science</i> (Davies et al 2021)	***None 12th wk
	F Apr 7	Tutorial (available to answer questions re: exam)	

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

L=lecture, D=discussion