

# Ecological Dynamics syllabus (Spring 2023)

## Info

- Class time/location: TR 12:00-1:15 in ADMIN 264
- [Class Schedule](#)

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- Office hours: SE1 288, T 3-4 PM or by appointment

Readings for the course will be provided on the schedule page. However, if you are new to theoretical biology, the following resources may prove helpful. The following code identifies the level at which the book is aimed: (B: Beginner; I: Intermediate; A: Advanced). These are must-have resources if you plan to do a lot of theory!

- *A Primer of Ecology* : Nicholas J. Gotelli (B)
- *Mathematical Biology I,II*: J.D. Murray (I/A)
- *Theoretical Biologists Toolbox*: Marc Mangel (B/I)
- *Nonlinear Dynamics and Chaos* : Steven Strogatz (B/I)
- *Quantitative Conservation Biology*: W.F. Morris, D.F. Doak (B/I)
- *The Ecological Detective* : Marc Mangel (B/I)
- *The Art of Modeling Dynamic Systems* : F. Morrison (I)

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### About the final project

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**Due Friday, April 28: Your Project Abstract** (Deposit on CatCourses). Please provide an abstract for the **Ecological Dynamics Seminar Proceedings**, with the following information: 1) The Background to the problem, 2) the main question you aim to address, 3) a general description of your approach and methods, and 4) a brief description of your primary results and the significance of these results so far. [Here](#) are some good general guidelines for writing an effective abstract.

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**Due Thursday, March 23: A paragraph describing your project idea and some expectations for how you will tackle the problem.** Specifically, I would like you to 1) identify the primary question that you hope to answer, 2) outline potential methodological approaches, and 3) describe how different results that you may obtain would inform your understanding of the primary question.

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The final project will feature a problem that you investigate using tools from the course, but related to your own research. The gold standard would be something that can add to your thesis, or serve as a publishable side project down the road. The idea will be to articulate an interesting question in your domain of expertise, find a way to investigate that question using tools from the course, and exploring the implications, etc. At the end of the course, you will give a formal presentation to the class in the form of a professional meeting talk (15-20 min) that gives us background, explanation of methods, and results. I'm available during office hours if you want to chat about ideas, techniques, etc.

**Due Thursday, March 2: A list of 2-3 ideas that you are considering for this project, with a very brief description of the question, and how you might tackle it for each.** Note that you aren't beholden to these ideas as they continue to grow and evolve. Be prepared to discuss these ideas in class on Thursday.

Date	Lect	Topic	Readings
1/17	T-L1	Introduction	<a href="#">TBT Chap2</a> {;target="_blank"} pgs 31-34; 36-43
1/19	R-L2	Population dynamics	
1/24	T-L3	Allometric reasoning 1	<a href="#">West et al. 2001</a> {;target="_blank"}
1/26	R-L4	Fixed points 1	<a href="#">NDC 1 (Strogatz)</a> {;target="_blank"}
1/31	T-L5	Fixed points 2	
2/2	R-L6	Bifurcations 1	<a href="#">NDC 2 (Strogatz)</a> {;target="_blank"}
2/7	T-L7	Bifurcations 2	
2/9	R-L8	Bifurcations 3	
2/14	T-L9	Generalized modeling	<a href="#">Yeakel2011</a>
2/16	R-L10	Interspecific interactions 1	
2/21	T-L11	Interspecific interactions 2	
2/23	R-L12	Complexity Stability 1	<a href="#">May 1972</a> {;target="_blank"}
2/28	T-L13	Allometric reasoning 2D	
3/2	R-L14	Eco-evolutionary dynamics 1	<a href="#">Lande 76</a>
3/7	T-L15	Eco-evolutionary dynamics 2	
3/9	R-L16	Eco-evolutionary dynamics 3	<a href="#">Schreiber 2011</a>
3/14	T-L17	Special Guest! <a href="#">Marc Mangel</a> (via ZOOM)	<a href="#">Mangel 1981, 1982</a>
3/16	R-L18	Adaptive foraging	<a href="#">Valdovinos 2010</a> <a href="#">Kondoh 2003</a>
3/21	T-L19	Canonical Equations for Activity Choice (CEAC) 1	
3/23	R-L20	CEAC 2	
3/28	T	<b>Spring Break – No Class</b>	
3/30	R	<b>Spring Break – No Class</b>	
4/4	T-L21	CEAC 3	
4/6	R-L22	CEAC + Reproductive gains 1	
4/11	T-L23	CEAC + Reproductive gains 2	
4/13	R-L24	Project discussions	
4/18	T-L25	CEAC + Reproductive gains 3	
4/20	R-L26	Cancelled	
4/25	T-L27	CEAC + Allocation processes	
4/27	R-L28	CEAC + population dynamics	
5/2	T-L29	EcoDyn Seminar 1 (Riley, Morgan, Josue)	
5/4	R-L30	EcoDyn Seminar 2 (Sonia, Hyejoo)	

