Community Ecology

Community ecology is the study of interactions between organisms and their environment in a given time and space. It has a rich theoretical basis, a tradition of experimentation and observation, and major applications in the world around us. In this class, we will integrate theory and evidence to see what it takes build and maintain communities from the ground up.

Course Objectives: This goal of this course is to broadly expose student to the principles, development and applications of community ecology work. Specifically, student should expect to:

- Gain profeciency in the mathmatical models of species interactions and community dynamics.
- Learn to recognize the patterns that structure communities across different scales and evaluate possible mechanisms for these patterns based in community ecology theory.
- Engage with applications of community ecology, with an understanding of the theory and evidance to contribute thoughtful to today's debates in the field.

Required text: Mittelbach, G. (2012) *Community Ecology.* Oxford University Press

Course Structure: This course will meet twice a week for a one hour lecture.

Prerequisites: A course in introductory biology or permission of instructor.

Topic	Reading(s)
1] What is Community Ecology anyway?	Mittelbach Ch. 1, *Velland 1999*
2] Patterns of Biodiversity	Mittelbach Ch. 2
3] Tradeoffs: Niche and Life History Theory	Argawal 2010, *Silverton 2004*
4] Basic Populations Models	Mittelbach Ch. 4
5] Age-structured populations	Gotelli p.50-62 (Canvas)
6] Population Genetics	Waits Ch. 3 (Canvas),
7] Models of Competition	Mittelbach Ch. 7
8] Competition in experiments and nature	Mittelbach Ch. 8, *Goldberg 1992*
9] Basic Models of Predation	Mittelbach Ch. 5
10] Selective and Responsive Predation	Mittelbach Ch. 6
11] Mutulism and Facilitation	Mittelbach Ch. 9, *Janzen 1966*
12] Eco-Evo	Mittelbach ch. 15, *Benton 2009*
13] Ecological Networks I	Mittelbach Ch.10
14] Food Chains and Webs	Mittelbach Ch.11, *Beschta 2003,2014*
15] Metapopulations and Patchy Environments	Ch. 12
16]Metacommunities and Assemby Theory	Mittelbach Ch.13 Mittelbach, *Leibold 2004*
17] Variable Environments and Species Coexistance	Mittelbach p. 291-303, *Fox 2013*
18] Historical Contingencies	Fukami 2015
19] Alternate stable states and Regime shifts	Mittelbach p. 304-313, *Folke 2004*
20] Compexity, stability and function	Mittelbach Ch. 3, *Tilman 1999*
21] Quaternary Biogeography	Tifney 1985, Gavin 2014
22] Invasion biology	Sax 2007, Richarson 2006
21] Invasion Debate	Gould 1998
24] Rewilding and Restoration	McLachlan 2007, Donlon 2005

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