Ecological Dynamics: Fall 2017

Week		Topic	Description	Readings	Assessments
	8/23	Course perspectives	Discuss outline of the course, go over goals, langauges		
		Discussion	None - organizational		
2	8/28	Discrete population growth	Growth, functional forms for growth, death, interactions		
	8/30	Continuous time population dynamics	Graphical analysis of exponential, logistic, competition; Fixed Points		
		Discussion			
3	9/4	LABOR DAY	No class		
	9/6	Linear Stability Analysis	Perturbations, Taylor expansion		
		Discussion			
4	9/11	Bifurcations I	Saddle node, transcritical, supercritical		
	9/13	Bifurcations II	Continued		
		Discussion			
5	9/18	Analysis of 2-D systems I	Graphical analysis of competition system, predator prey		
	9/20	Analysis of 2-D systems II	Linear stability analysis I		
		Discussion			
6	9/25	Analysis of 2-D systems III	Linear stability analysis II		
	9/27	Classification of fixed points	Fixed point analysis		
		Discussion			
7	10/2	Introduction to food webs	Jean Philippe guest lecture		
	10/4	Matrix theoryI	Introduction to large systems of interacting units		
		Discussion			
8	10/9	Generalized Modeling	Learning even more from a little: revisiting recruitment & predation		
	10/11	Pulse vs. press perturbations	Analytical and numerical perturbation analysis		

		Discussion			
9	10/16	Spatial interactions	Discrete spatial interactions and embedded interaction matrices		
	10/18	Eco-evolutionary dynamics	From Lande onwards		
		Discussion			
10	10/23	More evolution	Emily Jane McTavish guest lecture		
	10/25	Random walks and foraging dynamics intro	Uttam Bhat guest lecture		
		Discussion			
11	10/30	Foraging theory II	Optimal foraging theory and definitions of fitness		
	11/1	Stochastic dynamic programming I	Revisiting probability and introduction to approach		
		Discussion			
12	11/6	Stochastic dynamic programming II	Fitness equation and backwards equations		
	11/8	Stochastic dynamic programming III	Stochastic processes and tricks of the trade		
		Discussion			
13	11/13	Stochastic dynamic programming IV	Forward equations		
	11/15	Stochastic dynamics I	Introduction		
		Discussion			
14	11/20	Stochastic dynamics II	The Gambler's ruin		
	11/22	THANKSGIVING	No class		
		Discussion			
15	11/27	Open			
	11/29	Ecological Dynamics Mtg I	Presentations		
		Discussion			
16	12/4	Ecological Dynamics Mtg II	Presentations		
	12/6	Ecological Dynamics Mtg III	Presentations		
		Discussion			