

Fundamentals of Ecology (BIO 390E): Fall 2018 – Syllabus

Friday 2-5pm

BUR 228

- *The following statement from Courchamp and Bradshaw (2017) appropriately summarizes the ultimate goal of this course.*

“The progress of science is built on the foundations of previous research—we take the flame of our predecessors and pass it faithfully to the next generation of scientists, and so it has always been... This rush and the overwhelming load of available reading material makes it difficult to remain at the forefront of the methodological and conceptual advances of one’s discipline... It is self-evident that this harms scientists’ ability to be both rigorous and creative—two complementary features needed for high-quality research... important papers covering topics not directly related to one’s own specific field of research, or that are older than a few years, are even more difficult to identify, let alone read. It follows that defining which papers every ecologist—and certainly every ecology student—should take the time to read ought to become a priority to achieve satisfactory ecological literacy.”

Course Objectives

The objectives of this course are: 1) to receive an overview into concepts that are central to the study of ecology, 2) to familiarize ourselves with fundamental papers in ecology, 3) to consider this foundational work within the context of various study systems and 4) to discuss avenues by which we can advance upon this foundational research through our ongoing work.

Textbook and Readings

The recommended textbook for this course is *Fundamentals of Ecology* (5th edition) by Odum and Barret, and *A Primer of Ecology* (4th edition) by Nicholas J Gotelli. Papers will be available as PDF files and placed on the [class web site](#) at least one week in advance of the class for which they are assigned.

Assignments

One take-home written exam will be administered at the end of the semester. The exam is intended to synthesize the topics and will be comprised of questions proposed by guest lecturers.

Course Schedule

Week	Date	Topic	Assigned Reading
			<i>Bolded papers are required weekly reading</i>
1	August 31	Ecological Context of Evolution & Adaptation	Darwin and Wallace (1858) Dobzhansky (1973) Stearns (1976) Oksanen (1988)
2	September 7	Demography and Populations <i>Guest Lecturer:</i> Dr. Eric Pianka	Volterra (1926) Gause (1934) May (1974) Pianka (1976)

3	September 14	Competition and Niche Theory <i>Guest Lecturer:</i> Dr. Eric Pianka	Hardin (1960) Hairston et al. (1960) Hutchinson (1961) Pianka (1970) Pianka (1981)
4	September 21	Conversations in Climate Change <i>Group Discussion</i>	Vitousek (1994) Parmesan and Yohe (2003) Lüthi et al. (2007)
5	September 28	Mathematical Ecology I <i>Guest Lecturer:</i> Dr. Tim Keitt	May (1974) May (1976) Hollins (1973) mathnotes.pdf
6	September 28	Mathematical Ecology II <i>Guest Lecturer:</i> Dr. Tim Keitt	MacArthur (1955) May (1972) May (1977) Stenseth (1997)
7	October 12	Predation, Herbivory and Grazing <i>Guest Lecturer:</i> Dr. Aaron Rhodes	Elton (1942) Rosenzweig and MacArthur (1963) Paine (1966) MacArthur and Pianka (1966) Price et al. (1980) Prins (1992)
8	October 19	Coevolution, Mutualisms and Parasitism <i>Guest Lecturer:</i> Dr. Larry Gilbert	Ehrlich and Raven (1964) Benson et al. (1975) Janzen (1966) Gilbert (1972) Gilbert (1983) Gilbert (1992) Kilpatrick et al. (2017)
9	October 26	Biodiversity <i>Guest Lecturer:</i> Dr. Caroline Farrior	MacArthur (1958) Hutchinson (1959) Janzen (1970) Connell (1978) Chesson (2000) Hubbell (1997) Ellner et al. (2018)
10	November 2	Community Ecology <i>Guest Lecturer:</i> Dr. Norma Fowler.	Grinnel (1917) Forbes (1925) MacArthur and Levin (1964) Levin and Paine (1974) Tilman (1996)

			Brown et al. (2004) Redfield (1958) Bormann and Likens (1967)
11	November 9	Behavioral Ecology <i>Guest Lecturer:</i> Dr. Mike Ryan	Hamilton (1964) MacArthur and Pianka (1966) Trivers (1972)
12	November 16	Patterns and Determinants of Species Richness <i>Guest Lecturer:</i> Dr. Caroline Farrior	Janzen (1967) May and MacArthur (1972) Ricklefs (1987) Hubbell et al. (1999) Schitzer and Carson (2001)
13	November 23	Thanksgiving	-----
14	November 30	Experimental Design of Ecological Field Experiments <i>Guest Lecturer:</i> Dr. Tom Juenger	Hurlbert (1984) Wootton and Pfister (1998) Jost (2006)
15	December 7	Conservation Biology <i>Guest Lecturer:</i> Dr. Norma Fowler	Hardin (1968) Buckley et al. (2004) Van Lear et al. (2005) Vredenburg et al. (2010)

Recommended Further Reading

Papers

- Courchamp and Bradshaw (2017) 100 articles that every ecologist should read.
- [Dobzhansky \(1950\) Evolution in the tropics.](#)
- Erwin (1982) Tropical forests: their richness in Coleoptera and other arthropod species.
- Felsenstein (1981) Skepticism towards Santa Rosalia, or why are there so few kinds of animals?
- Hamilton and Zuk (1982) Heritable True Fitness and Bright Birds- A Role for Parasites?
- Holdridge & Grenke (1971) Ecological life zones.
- Olson et al. (2001) Global map of terrestrial ecoregions.

Textbooks

- *Foundations of Ecology: classic papers with commentaries.* 2012. Real and Brown (Eds.)
- *Essentials of Ecology* - 4th edition. Begon, Howarth and Townsend (Eds.)
- *The Princeton Guide to Ecology.* Levin et al. (Eds.)
- *Fundamentals of Ecology* (5th edition) by Odum and Barret

- *A Primer of Ecology* (4th edition) by Nicholas J Gotelli
- *Pianka. Evolutionary Ecology 7thth Edition eBook*. 2011
Read on Line: <http://www.zo.utexas.edu/courses/bio301/Read-on-line2.html>

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