SUGGESTED READING, COURSES, and other RESOURCES

This list provides a suggested reading list and resources for students to obtain skills and knowledge as outlined in the core requirements for Ph.D. students in the Graduate Program of Ecology and Evolution at Rutgers University. The list will be continuously updated and posted publicly on the E&E website.

TOPIC: GENERAL LIFE SCIENCE

Textbooks and other books


Classic research articles


Review articles

Non-E&E courses at Rutgers University (for E&E courses, please see the E&E website)

Courses at other institutions

Websites and other media

Extra-curricular and popular novels, movies, and other works


TOPIC: INDIVIDUALS, POPULATIONS, AND COMMUNITIES

Textbooks and other books

A unique, graduate-level introduction to physiological ecology, where emphasis is clearly on ecology, not physiology. Indeed, many physiological systems, which are covered in all other animal physiology and environmental physiology textbooks, are not discussed at all in this book. Recommended by Henry John-Alder.


Oxford U Press. Beginning Graduate level. An overview of biological and physical innovations and events that led to the evolution of life as we know it. A great primer that spans macromolecules arising from primordial ooze to the evolution of language. Recommended by Siobain Duffy.

Van Straalen, N.M. and Roeloes, D. 2006. **An Introduction to Ecological Genomics,**
especially chapters 4-7.
This is “a textbook for a discipline that is yet to develop”, as written by the authors. It introduces a genomics perspective on classic issues in community ecology, life-history patterns, and ecological stress. Recommended by Henry John-Alder.

Willmer, P., Stone, G., and Johnston, I. 2005. **Environmental Physiology of Animals,**
2nd ed.
A comprehensive, graduate-level introduction to environmental physiology, with emphasis on physiological traits of organisms in different types of habitats. Recommended by Henry John-Alder.

Classic research articles

Barkai, A. & McQuaid, C. (1988). **Predator-prey role reversal in a marine benthic ecosystem.** Science, 242, 62-64. Nice example of how even the most seemingly fundamental aspects of predator-prey interactions (who’s the predator and who’s the prey) can be density dependent. Recommended by Olaf Jensen.

Review articles


Non-E&E courses at Rutgers University (for E&E courses, please see the E&E website)

Courses at other institutions

Websites and other media
Darwin, An origin of species
(PBS interactive): LINK Undergraduate and Beginning Graduate Level. Recommended by Lena Struwe.

Darwin’s Diary
(PBS interactive): LINK Undergraduate and Beginning Graduate Level. Recommended by Lena Struwe.

Evolution Enclaves: Darwin the Botanist and Origins of Life Research,
interview with David Kohn by Steve Mirsky (Science Talk), (NPR Scientific American; read transcript, download or listen online): LINK Undergraduate and Beginning Graduate Level. Recommended by Lena Struwe.
Extra-curricular and popular novels, movies, and other works

Any of the David Attenborough “Life of…” videos (mammals, birds, invertebrates (“Life in the Undergrowth”), reptiles). Unbelievable photography, and a huge amount of excellent natural history and ecology. Recommended by J. Ehrenfeld

TOPIC: PHYLOGENETICS AND SYSTEMATICS

Textbooks and other books

Dawkins, R. 2005. The Ancestor's Tale: A Pilgrimage to the Dawn of Evolution. Undergraduate and Beginning Graduate Level. Interesting take on walking the phylogenetic tree down from humans to the smallest bacteria, also includes descriptions of many evolutionary concepts on both the macro and micro-level. Recommended by Lena Struwe.


Classic research articles


Review articles

Non-E&E courses at Rutgers University (for E&E courses, please see the E&E website)


Hands-on course in plant systematics methods and techniques used in plant systematics, phylogenetics, and biogeography. Lab, software demos, and lectures will be intermingled with independent projects and discussions. How to write a good paper, peer-review. Taught by Lena Struwe, every second spring semester.

Plant Systematics


Courses at other institutions
Websites and other media

*The complete work of Charles Darwin Online.* Undergraduate to Advanced Graduate level. His books, articles, letters, it is all here, evolutionary topics. [http://darwin-online.org.uk/](http://darwin-online.org.uk/) Recommended by Lena Struwe

*All in the family*

building phylogenetic trees, PBS (online interactive): [LINK](http://darwin-online.org.uk/) Undergraduate to Beginning Graduate level. Recommended by Lena Struwe.

*Evolution 101.*

University of California Museum of Paleontology (online tutorial): [LINK](http://darwin-online.org.uk/) Undergraduate to Beginning Graduate level. Recommended by Lena Struwe.

*Extinction*

(PBS interactive): [LINK](http://darwin-online.org.uk/) Recommended by Lena Struwe.

*Judgment Day: Intelligent Design on Trial,*

PBS NOVA (on-line video and other materials about the Dover trial): [LINK](http://darwin-online.org.uk/) Undergraduate to Beginning Graduate level. Recommended by Lena Struwe.

*Phylogenetic Systematics,*

University of California Museum of Paleontology (online tutorial): [LINK](http://darwin-online.org.uk/) Beginning Graduate level. Recommended by Lena Struwe.

*Understanding Evolution,*

University of California Museum of Paleontology (online tutorial): [LINK](http://darwin-online.org.uk/) Undergraduate to Beginning Graduate level. Recommended by Lena Struwe.

Extra-curricular and popular novels, movies, and other works

**TOPIC: ECOSYSTEMS**

**Textbooks and other books**


An excellent example of how ecosystems analyses are done, and how they are applied to understanding human effects and disturbances. Short but well worth the read. Recommended by J. Ehrenfeld.


Classic research articles


Ryther, J. 1969. Photosynthesis and fish production in the sea. Science 166: 72-76. A back of the envelope calculation that has proven to be astonishingly accurate. Recommended by Olaf Jensen.


Review articles


Non-E&E courses at Rutgers University (for E&E courses, please see the E&E website)

Courses at other institutions

Websites and other media
The Millennium Ecosystem Assessment. A unique attempt to catalog the most important ecosystem changes at a global scale and envision alternative “scenarios” for society and their ecosystem consequences.

Extra-curricular and popular novels, movies, and other works

**TOPIC: BIODIVERSITY, TEMPORAL AND SPATIAL SCALE**

Textbooks and other books

Classic research articles


Review articles
examination of the various reasons and mechanisms that most organisms fail to be
generalists. A good introduction to how evolutionary biologists pose questions and
think them through. Recommended by Siobain Duffy.

Kassen, R. 2002. The experimental evolution of specialists, generalists, and the
from experimental studies with eukaryotes, bacteria and viruses are summarized and
applied to how niche breath evolves in nature. Recommended by Siobain Duffy.

Kremen.C. 2005. Managing ecosystem services: what do we need to know about

Undergraduate/popular article. Paleobotany, angiosperms, morphology.
Recommended by Lena Struwe.

Tilman, D. 1999. The ecological consequences of changes in biodiversity: a search for
Rachael Winfree.

**Non-E&E courses at Rutgers University** (for E&E courses, please see the E&E
website)

**Courses at other institutions**
Courses at Woods Hole: Microbial Diversity, etc. Check current offerings.
Recommended by Lena Struwe.

**Websites and other media**

*Classifying life*
(PBS interactive): [LINK](#) Recommended by Lena Struwe.

*Fearless Planet: Earth Story*
Discovery Channel (view online, 44 min): [LINK](#) Recommended by Lena Struwe.

*History of Life on Earth*
(PBS interactive): [LINK](#) Recommended by Lena Struwe.

*Origins of Earth*
(PBS interactive): [LINK](#) Recommended by Lena Struwe.

*Plant Evolution Timeline*
University of Cambridge (online interactive): [LINK](#) Recommended by Lena
Struwe.

*Tree of Life*
(PBS interactive): [LINK](#) Recommended by Lena Struwe.
Extra-curricular and popular novels, movies, and other works

TOPIC: ANALYSIS OF DATA

Textbooks and other books
Hilborn, R., and Mangel, M. 1997. The ecological detective: confronting models with data, Princeton University Press, Princeton, New Jersey. One of the most readable introductions to maximum likelihood and Bayesian data analysis methods. Recommended by Olaf Jensen.


Tufte, E. 2005. The Visual Display of Quantitative Information, ed. 2. General audience level. How to make great graphics with the highest information content, one of several great books by Ed Tufte about visual communication. Recommended by Lena Struwe.

Classic research articles


Review articles

Non-E&E courses at Rutgers University (for E&E courses, please see the E&E website)

Courses at other institutions

Websites and other media
AD (Automatic Differentiation) Model Builder (ADMB). Website for downloading the best available software (now free) for many kinds of nonlinear optimization (estimating the parameters of nonlinear models by fitting models to data). If you’re running up against the limits of functions like Solver (Excel), fmins (Matlab), or optim (R), ADMB is the place to go. Unfortunately, ADMB is not at all user friendly. http://admb-project.org/ Recommended by Olaf Jensen.

The R Project. Website for downloading the most widely used (and free) software for statistical analysis and modeling in ecology (and many other disciplines). http://www.r-project.org/ Recommended by Olaf Jensen.
Extra-curricular and popular novels, movies, and other works


**TOPIC: ACADEMIC INTEGRITY, INFORMATION DISSEMINATION, MENTORING, TEACHING, ETC.**

Textbooks and other books

Carraway, Leslie N. 2009.  *Improve Scientific Writing and Avoid Perishing*. Amer. Midland Naturalist 161:361-370. Another very useful article on how to assemble a manuscript, with many good pointers on writing. Recommended by J. Ehrenfeld.


Donovan, M.S., J. Bransford, & J. Pellegrino. 2000.  *How people learn: bridging research and practice*. National Academies Press. This is a very accessible book that provides the reader a global perspective on both theory and application in education. This is a nice way to become familiar with the research behind the best practices in education and can be useful for teaching philosophies. Recommended by Rebecca Jordan.


Nilson, L. 2010.  *Teaching at its best: a research-based resource for college instructors*. Book. This is an excellent and very comprehensive resource for those
interested in post-secondary education. This book will provide practical tips on almost every aspect of preparing for the college classroom. Recommended by Rebecca Jordan.

Reif, F. 2008. *Applying cognitive science to education: thinking and learning in scientific and other complex domains*. Book. This book digs deeply into cognitive theory and the science classroom. One need not have a background in the cognitive sciences but should be prepared for a deep exploration into cognitive ideas. Recommended by Rebecca Jordan.


**Classic research articles**


**Review articles**


**Non-E&E courses at Rutgers University** (for E&E courses, please see the E&E website)

**Courses at other institutions**

**Websites and other media**

*Chronicle of Higher Education Advice section* (though many articles in the CoHE
might be of interest) http://chronicle.com/section/Advise/66/ The Chronicle predominately covers teaching-oriented institutions, including community colleges, so this can be a great resource for teaching advice. Recommended by Siobain Duffy.

**Female Science Professor.** A tenured physicist relates how she has navigated grad school, postdocing, mentoring, applying for funding as a junior and senior researcher, negotiating multiple jobs, teaching, and work-life balance. Sometimes off-topic (novels, cats) but some of the best mentoring-oriented blogging out there. http://science-professor.blogspot.com/ Recommended by Siobain Duffy.

**General Communication website.**

**General advice about writing website.**

**Resources for students on Academic Integrity.** web link list at Rutgers University http://academicintegrity.rutgers.edu/students.shtml Recommended by Rebecca Jordan.

**Some Modest Advice for Graduate Students** Accept few imitations of this empowering screed. http://www.yale.edu/eeb/stearns/advice.htm Recommended by Siobain Duffy.

**Surviving Graduate Schools websites.**
http://eebio.tulane.edu/graduate/survive-grad-school.php and (with focus on computer science, but still relevant) http://www.cs.unc.edu/~azuma/hitch4.html. Recommended by Rebecca Jordan.

Extra-curricular and popular novels, movies, and other works