Fall 2018

BIOL 698-101: Ecology

Daniel Bunker

NJIT BIOLOGY

Course Syllabus

FALL 2018

BIOLOGY 698-101: ECOLOGY

INSTRUCTOR:	Dr. Daniel Bunker	**PHONE:**	973-642-7537
OFFICE:	337B Central King Building	**EMAIL:**	dbunker@njit.edu
OFFICE HOURS:	T: 3:00PM – 4:00PM & By appointment	**COURSE WEBSITE:**	http://moodle.njit.edu/
COURSE SCHEDULE:	T: 6:00PM– 9:00PM, , CKB 126, NJIT		

SUMMARY: This course will introduce graduate students to the field of ecology – the study of interactions among organisms and their environment. The course is team taught by Profs. Dan Bunker, Gareth Russell, Claus Holzapfel, and Karina Schäfer. Topics will include:

- Autecology: What determines interactions between species and their environment?
- Population Ecology. What determines the abundance, dispersion, age structure, and dynamics of biological populations?
- Species Interactions. What is the nature of species interactions such as competition, predation, parasitism, and mutualism? How do these interactions influence distribution and abundance?
- Community Ecology. What determines the structure, organization, and dynamics of groups of coexisting species?
- Ecosystem Ecology. How do materials and energy move through the biotic and abiotic components of ecosystems? How do organisms and abiotic factors influence the structure and function of ecosystems?
- Applied ecology. How do we apply ecological principles to problems such as conservation biology, global change, and sustainability?

LEARNING OBJECTIVES: This course will introduce students to topics in ecology and to the scientific method as applied to ecological research. Students will:

- Learn how to understand and evaluate scientific publications;
- Learn how to ask ecological questions, formulate hypotheses, generate predictions, design and conduct experiments, and interpret data;
- Gain an understanding of the structure of knowledge in ecology, biology, and the natural sciences in general;
- Gain in-depth understanding of foundational and contemporary topics in ecological research.

PREREQUISITES: None.

REQUIRED MATERIALS:

- Text: The Princeton Guide to Ecology; Simon A. Levin, Editor; Stephen R. Carpenter, H. Charles J. Godfray, Ann P. Kinzig, Michel Loreau, Jonathan B. Losos, Brian Walker & David S. Wilcove, associate editors; ISBN 9780691156040

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RECOMMENDED TEXTBOOK:

Foundations of Ecology, Classic Papers with Commentaries; Leslie Real and James Brown, editors; ISBN: 978022670594.

We will be reading many of the papers in Foundations of Ecology. It is a great compilation of classic ecology papers and worth having. However, many of the papers can be found in Scopus, Web of Science, or JSTOR.

GRADING:

The course is team taught by Profs. Bunker, Russell, Holzapfel, and Schäfer. Each prof will grade you on 25% of the course, with their own grading schema.

Professor	Percentage
Bunker: Hypotheses assignments, presentation	25%
Russell	25%
Holzapfel	25%
Schafer: Project & presentation Ecosystem section	25%
Total	**100%**

Letter Grade	Percentage
A	90 – 100
B+	85 – 90
B	80 – 85
C+	75 – 80
C	70 – 75
D	60 – 70
F	0 - 60

COURSE WEB PAGE: We will use Moodle for coursework submission, for announcements, and for various activities. To use Moodle students must have an NJIT UCID. If you are matriculated at NJIT you should already have a UCID. If you are a Rutgers student you may already have one. You can check by following the directions here: https://ist.njit.edu/ucid/. If you do not have one you can request one here: https://newacct.njit.edu/~accts/cgi-bin/new or call the NJIT helpdesk for assistance (973- 596- 2900).

BIOLOGY 698-101 COURSE POLICIES:

- **Attendance and Participation:** As a graduate student, we expect that you will be fully engaged in this course and your graduate work in general. Failure to attend class and participate fully may result in failure in the class.

- **Assignments:** This course will cover a large amount of material and will move quickly. Reading assignments will be posted on Moodle and/or disseminated via email. It is your responsibility to read all assigned materials before class meets and be fully prepared to discuss in class. Assignments will be made by individual instructors and will be due when stated.

- **Makeup Policy:** Make up exams will be possible only with a doctor's or a dean's letter or with prior approval. If you have a serious reason for missing an exam, you must contact me BEFORE the scheduled exam.

- **Academic Integrity:** Students are reminded of the Honor Code each you agreed to upon entering NJIT. Violations of Academic Integrity will be dealt with according to the guidelines indicated in the NJIT Academic Honor Code. Please re-read Article III of the Honor Code, which describes conducts that are considered unacceptable (cheating, violating the US Copyright law, etc). I will not tolerate cheating – it is my responsibility to protect my students from cheaters and I will do so. Cheating during exams will not be tolerated, nor will any form of plagiarism.

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KEY DATES:

T: Sept. 4:	First day of classes	M: Nov. 12:	**Last Day to Withdraw**
M: Sept. 10:	**Last day to add/drop**	T: Nov. 20	Follows Thurs. schedule, **No Class**
M: Sept. 17:	Last day to withdraw with 90% refund	W. Dec. 12	Last Day of Classes

COURSE OUTLINE:

DAY	DATE	TOPIC	ASSIGNMENT
T	4-Sept.	Bunker: Introduction, The Niche, walking field trip	*Grinnell 1917, Elton 1927 Chs. 1-5*
T	11-Sept.	Bunker: Niches, Adaptations, and Phenotypes	TBD
T	18-Sept.	Bunker: Communities	TBD
T	25-Sept.	Bunker: Biodiversity	TBD
T	02-Oct.	Russell: Population Dynamics in Time and Space	*PG Chapters II.2 through II.4.*
T	09-Oct.	Russell: Landscape Ecology	*PG Chapters IV.1 through IV.3.*
T	16-Oct.	Russell: Conservation as Applied Ecology	*Soule 1984, Kareiva and Marvier 2012, Pimm et al 2014.*
T	23-Oct.	Holzapfel: Community Assembly	TBD
T	30-Oct.	Holzapfel: Interactions (competition, predation, mutualism, etc)	TBD
T	6-Nov.	Holzapfel: Multitrophic communities	TBD
T	13-Nov.	Schäfer: Ecosystem Ecology – begin project	*Chapin et al., 2012, Chapin et al., 2006, Costanza et al., 1997*
T	20-Nov.	**No Class** - Thursday schedule	
T	27-Nov.	Schäfer: Global Change	*Cai et al., 2016, Cook et al., 2013, Epstein, 2005*
T	04-Dec.	Schäfer: Sustainability, project presentations, **Project Report Due**	*Foley et al., 2007, Jackson, 2008, Rockström et al., 2009)*
T	11-Dec.	Bunker: Macroecology, biogeography, and global change	TBD
FINAL EXAM WEEK: DECEMBER 15-21, 2018* **			

***DO NOT MAKE ANY TRAVEL ARRANGEMENTS DURING THIS TIME ***