

**ECOL 3505H (07-494) – Honors Ecology**

**Spring Semester 2013**

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Text: *Fundamentals of Ecology, Fifth Edition*, Eugene P. Odum and Gary W. Barrett

Exercise book: *Ecology Exercise Book: An Ecosystem Approach*, Gary W. Barrett, Terry L. Barrett, Scott J. Connelly, Andrew S. Mehring, and James O. Moree

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Information:

**In addition to assignments from the text, you are responsible for information encompassing lecture notes, handouts, DVDs, additional reading assignments, and class discussions. Therefore, attendance is mandatory if you are to maximize your understanding of principles, concepts, mechanisms, and natural laws that are presented during this course. All academic work must meet the standards contained in “a culture of honesty.” Students are responsible for informing themselves about those standards before performing any academic work ([http://honesty.uga.edu/ahpd/culture\\_honesty.htm](http://honesty.uga.edu/ahpd/culture_honesty.htm)).**

**It is important to understand that a possible grade for withdrawal after the midpoint of the semester is a *WF*, which carries the same numerical grade as an *F* (0 points). A *WF* will be given 2 school days following the midpoint withdrawal deadline (21 March 2013) to those students who have stopped attending class, failed to take test #1, and consequently are failing the course at that time.**

**It is your responsibility to make certain that all laboratory assignments are turned in on time, and that you know your grade regarding these assignments. Once the final laboratory grade is turned in to Dr. Barrett, there will be no consideration regarding changing this grade.**

## SYLLABUS

ECOL 3505H (07-494) Honors Ecology Spring Semester 2013 – G. W. Barrett

*The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.*

### THE SCIENCE OF ECOLOGY

DATE	TOPIC	ASSIGNMENT
JANUARY 8 (T)	<b>Introduction:</b> Course Objectives; Grading; Handout Materials; Learning Pyramid	Foreword; Preface
JANUARY 10 (R)	<b>The Scope of Ecology:</b> History; Ecology versus Economics; DVD: <i>Eugene P. Odum: An Ecologist's Life</i>	Chapter 1
JANUARY 15 (T)	<b>Levels of Organization:</b> Transcending Processes; Hierarchy Theory; Holism versus Reductionism	Chapter 1

### ECOSYSTEM ECOLOGY

DATE	TOPIC	ASSIGNMENT
JANUARY 17 (R)	<b>Ecosystem Structure:</b> Trophic levels; Laws of Thermodynamics; Definitions of Energetics; Ecosystem Regulation	Chapter 2
JANUARY 22 (T)	<b>Definitions and Energy Language:</b> Cybernetics; P/R ratios; Concept of Sustainability; Maximum Power Principle; The Ecosystem Concept	Chapter 2
JANUARY 24 (R)	<b>The Science of Limnology:</b> Formation of Lakes; Lotic versus Lentic Systems; Thermal Stratification; Lake Zonation	Chapter 10 (pp. 424-428)
JANUARY 29 (T)	<b>Net Primary Productivity:</b> Concept of Net Energy (Emergy); Grazing versus Detritus Food Chains; Energy Flow Models	Chapter 3
JANUARY 31 (R)	<b>DVD:</b> <i>Aldo Leopold: His Life and Thoughts</i> ; Discussion on Transcending Processes and Levels of Organization Concept	Chapter 3
FEBRUARY 5 (T)	<b>TEST 1</b>	
FEBRUARY 7 (R)	<b>Biogeochemical Cycles:</b> Open versus Closed Cycles; Nitrogen versus Phosphorus Cycles; Carbon Cycle (global climate change)	Chapter 4
FEBRUARY 12 (T)	<b>The Watershed Concept:</b> Nutrient Budgets; DVD: <i>Chemistry of a Forest</i> ; Buried Seed Strategy	Chapter 4
FEBRUARY 14 (R)	<b>Limiting and Regulatory Factors:</b> Liebig Law of the Minimum; Shelford's Law of Tolerance	Chapter 5
FEBRUARY 19 (T)	<b>Concept of Biological Magnification:</b> Fire Ecology; Fire-adapted Systems	Chapter 5
FEBRUARY 21 (R)	<b>DVD:</b> <i>Rachel Carson: Silent Spring</i>	Chapter 5

## POPULATION ECOLOGY

DATE	TOPIC	ASSIGNMENT
FEBRUARY 26 (T)	<b>Properties of Populations:</b> Age Pyramids; Concept of Carrying Capacity (K); Growth Curves	Chapter 6
FEBRUARY 28 (R)	<b>Population Regulation:</b> Patterns of Dispersal; Allee's Principle of Aggregation	Chapter 6
MARCH 4 (T)	<b>Metapopulation Dynamics:</b> Home Range versus Territory; Population Regulation	Chapter 6
MARCH 6 (R)	<b>Test 2</b>	
MARCH 11-15	<b>Spring Break</b>	

## COMMUNITY ECOLOGY

DATE	TOPIC	ASSIGNMENT
MARCH 19 (T)	<b>Types of Interactions:</b> Concept of Co-evolution; Positive/Negative Interactions; Role of Secondary Chemistry	Chapter 7
MARCH 21 (R)	<b>Habitat, Niche, and Guild:</b> Diversity/Stability Hypothesis; Bottom Up versus Top Down Processes	Chapter 7
MARCH 26 (T)	<b>DVD:</b> <i>Strange Disappearance: The Bees</i>	Chapter 7

## ECOSYSTEM DEVELOPMENT

DATE	TOPIC	ASSIGNMENT
MARCH 28 (R)	<b>Strategy of Ecosystem Development:</b> Autogenic versus Allogenic Succession	Chapter 8
APRIL 2 (T)	<b>Trends in Ecological Development:</b> Perturbation-Development Systems	Chapter 8

## LANDSCAPE ECOLOGY

DATE	TOPIC	ASSIGNMENT
APRIL 4 (R)	<b>Landscape Elements:</b> Source/Sink Dynamics; Alpha, Beta, and Gamma Diversity	Chapter 9
APRIL 9 (T)	<b>Role of Landscape Corridors:</b> DVD: <i>Landscape Linkages</i> ; Island Biogeography	Chapter 9
APRIL 11 (R)	<b>Landscape Geometry:</b> Agroecosystem Ecology; Concepts of LISA and IPM	Chapter 9

## REGIONAL AND BIOME ECOLOGY

DATE	TOPIC	ASSIGNMENT
APRIL 16 (T)	<b>The Biome Concept:</b> Terrestrial Biomes	Chapter 10
APRIL 18 (R)	<b>The Noosphere Concept:</b> Relationship of Precipitation and Temperature; Problem-Solving Algorithm	Chapter 10

## GLOBAL AND APPLIED ECOLOGY

DATE	TOPIC	ASSIGNMENT
APRIL 23 (T)	<b>Market and Nonmarket Capital:</b> Ecological/Societal Gaps; Concept of Aesthetics as Economy (Terry L. Barrett)	Chapter 11
APRIL 25 (R)	<b>Statistical Thinking:</b> Importance of Research Design (R. Cary Tuckfield)	Chapter 12
MAY 7 (T)	<b>FINAL EXAM</b> (8:00 – 11:00 a.m.)	

## COURSE INFORMATION

**Description:** Lecture, discussions, laboratory sessions, and field trips about the science of ecology mainly focus on the following levels of organization: organism, population, community, ecosystem, landscape, biome, and global. As summarized in the lecture syllabus, a broad range of topics related to the science of ecology will be covered. The lecture material will assume that you have a basic knowledge of general biology (BIOL 1108 or equivalent is a prerequisite for this course). This course also prepares you for advanced courses in limnology, population and community ecology, behavioral ecology, and ecosystem ecology.

**Textbook:** The text *Fundamentals of Ecology, Fifth Edition*, by Eugene P. Odum and Gary W. Barrett can be purchased from the University bookstore. You are expected to read the appropriate assigned chapters before each lecture is presented. Additional readings will be used as complementary material for lecture.

**Examinations/Grading:** There will be two major tests and a final exam. The final exam (3 hours) is scheduled for 8:00 -11:00 a.m. on Tuesday, 7 May 2013. Grades will be based on the following criteria:

Test 1	20%	90 - 100% A	<b>Example:</b>
Test 2	20%	80 - 89% B	87% - 89% B+
Discussion	15%	70 - 79% C	83% - 86% B
Lab	25%	60 - 69% D	80% - 82% B-
Final Exam	20%	< 60% F	

The final exam will cover material presented in lectures from 19 March through 25 April.

**Overview comments:** I will periodically provide you with the opportunity to receive “**Bonus Points.**” You must follow instructions to receive bonus points. These points will be added to the next scheduled exam. *You will not be permitted to do special projects (e.g., term papers) to improve your grade later in the semester. Attend each lecture and laboratory session, understand course material on a daily basis, and you will perform well in the course. We will make a sincere effort to enrich your learning experience.*

Gary W. Barrett