

**The University of Oklahoma**  
**College of Liberal Studies**  
**Ecology and Evolution, LSTD 3443 811**  
**June 5, 12, 19, 26, July 3, 10, 17, 24: 7:30-9:30 p.m.**  
**Oklahoma City Community College**  
**Main Building, Room 2N3**

**Professor: Dr. Anthony J. Stancampiano**  
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**Introduction and Overview**

This course addresses the interaction of ecology and genetic alteration in bringing about biological diversity through evolution. It assumes that students have a basic understanding of what constitutes an organism and how organisms perform the basic functions of living systems. A review of these topics can be found in Chapters 4-7 of [Biology: Concepts and Applications](#).

Your course grade will be determined, in large part, by your ability to express clearly your understanding of the material you have read and how well you understand the scientific principles described in your readings.

**Course Objectives**

Demonstrate an understanding of topics in ecology, evolution, macroevolution, and diversity

Define and discuss ecology, including the biosphere, nature of ecology, and community interaction and ecology

Explain and discuss ecology from an interdisciplinary perspective and a global society

Successfully examine and critique opposing viewpoints/positions concerning addressed topics and how they pertain to current world problems

Define and discuss macroevolution, including: fossil records, molecular records, and human evolution

Explain some of the current problems presented in the texts

Successfully examine and critique opposing viewpoints/positions concerning addressed topics and how they pertain to current perceptions of the world

Look at the course content and issues from multiple, interdisciplinary perspectives

Make connections between course content and one's experiences

Place the ideas, problem-solving skills, and analytical strategies presented through the resources used for this course into the context of one's life, academic, or professional objectives

Required Texts:

Starr, C. (2002) Biology: Concepts and Application,  
6<sup>th</sup> Edition, Belmont, CA: Thomson Brooks/Cole.  
ISBN: 0-534-38558-3

Weiner, Jonathon (1995) The Beak of the Finch  
New York, New York: Vintage Books  
ISBN-10: 0-679-73337-X; ISBN-13: 978-0-6797-3337-X

### **Course Work Description**

LSTD 3443 is presented as a hybrid of online and onsite components. Both **class attendance** and participation in **class activities**, such as discussions and group projects, are important aspects of the course. Additionally, the student will utilize online resources to explore new research and concepts beyond the classroom setting.

Attendance at each class is extremely important due to the limited number of class meetings. Additionally, there will be six in-class activities that will be conducted during class in small groups. These can only be completed in class. **If the student is absent, the activities cannot be made-up.**

Onsite activities are designed to reinforce and apply the online work. Therefore, it is critical that the student stays on track in completing online work.

This course is divided into four units. Each unit will be accompanied by a set of questions listed under the online Think About It! section. These are designed to help you identify and address key concepts.

Your online assignments for each unit are:

1. To read the assigned chapters from the texts;
2. To read the content of each of the assigned Web sites;
3. To locate and read the contents of the assigned web sites under **Check Out These Web sites** for each unit;
4. To answer all five questions under the **Think About It!** section of each unit. Each answer should be well thought out, organized, based on information from your readings or online research, and sufficiently long enough to answer the question;
5. To prepare and submit an annotated bibliography consisting of the six Web sites/links you have located. The annotation should consist of the Web address and sufficient description (minimum of 5-6 descriptive sentences) of the contents of the sites so your instructor can tell what the Web sites cover.

### **Final Project**

In addition to completing the assignments for the individual units, you will identify, research, and submit an oral presentation over an approved topic related to the course. This topic must be

taken from the general topics covered in the course. All references cited should be included in a bibliography at the end of the presentation. The Final Project will have three parts: Part A includes approval of the topic by your professor. Part B includes a detailed outline of the presentation including a bibliography with a minimum of 5 sources. Part C is the in class presentation.

A portion of the work for the final project will be due in Units 1, 2, and 4.

With the exception of the in class Presentation, all of the assignments listed above will be turned into the appropriate DropBox folder at the **D2L website** for this course and section.

### **Grading information**

4 Web Bibliographies @ 50 pts each	= 200 points
4 Think About It Questions @50 pts each	= 200 points
6 In-Class Activities @ 20 points each	= 120 points
Class participation 8 class meetings @ 10 points each	= 80 points
Final Presentation:	
Topic with bibliography (Due January 22)	= 5 points
Outline with bibliography (Due February 5)	= 25 points
Presentation	= <u>170 points</u>
	800 points total

### **Grading Scale**

720 – 800 Points – A  
640 – 719 Points – B  
560 – 639 Points – C  
480 – 559 Points – D  
0 – 479 Points – F

There will be no curving of grades in this course.

### **Professor Biography**

**Dr. Anthony J. Stancampiano** earned his Ph.D. in Zoology from the University of Oklahoma in 1999. Additionally, he has a B.S. in Biology from the University of Central Oklahoma and an M.S. in Biology from the University of Central Oklahoma. He has been a faculty member at OCCC since 1995, where he is course coordinator for the Zoology and Comparative Vertebrate Anatomy courses. Areas of research interest include mammalian ecology, landscape ecology, and geographic information systems.

## **Academic Misconduct Statement**

Any act which improperly affects the evaluation of a student's academic performance or achievement, including but not limited to the following:

- (a) Cheating: the use of unauthorized materials, methods, or information in any academic exercise, including improper collaboration;
- (b) Plagiarism: the representation of the words or ideas of another as one's own, including:
  - (1) direct quotation without both attribution and indication that the material is being directly quoted, e.g. quotation marks;
  - (2) paraphrase without attribution;
  - (3) paraphrase with or without attribution where the wording of the original remains substantially intact and is represented as the author's own;
  - (4) expression in one's own words, but without attribution, of ideas, arguments, lines of reasoning, facts, processes, or other products of the intellect where such material is learned from the work of another and is not part of the general fund of common academic knowledge;
- (c) Fabrication: the falsification or invention of any information or citation in an academic exercise;
- (d) Fraud: the falsification, forgery, or misrepresentation of academic work, including the resubmission of work performed for one class for credit in another class without the informed permission of the second instructor; or the falsification, forgery or misrepresentation of other academic records or documents, including admissions materials and transcripts; or the communication of false or misleading statements to obtain academic advantage or to avoid academic penalty;
- (e) Destruction, misappropriation or unauthorized possession of University property or the property of another;
- (f) Bribery or intimidation;
- (g) Assisting others in any act proscribed by this Code; or
- (h) Attempting to engage in such acts.

Penalties are listed in the Academic Code. For further information on academic misconduct please refer to the following link: <http://www.ou.edu/provost/integrity/>

## **Disability Statement**

**Disability Issues:** Any student in this course who has a disability that may prevent her or him from fully demonstrating his or her academic abilities should contact Frank Rodriguez (405-325-1061) as soon as possible to discuss the accommodations necessary to ensure full participation and to facilitate your educational opportunities. For further information on disability issues please refer to the following link: <http://www.dsa.ou.edu/ods/index.html>

## **Course Outline**

### Unit 1—June 5, June 12      Ecology

Unit One introduces the topic of ecology, which is the study of the interaction of an organism with its environment, including other organisms. It is a changing environment acting on genetically diverse organisms that provide the basis for natural selection.

#### Reading Assignments:

Starr, Chapter 1, 40- 44

Weiner, Chapter 4, 5, 19

#### **Objectives for Unit 1**

How unity underlies the world of life

How ecological principles govern the growth and sustainability of all populations

How genes underlie the behavioral ability of individuals

How evolved modes of communication underlie social behavior

How and why every species in the community has its own niche

How interactions among species influence the structure of the community

How an ecosystem is an association of organisms and their physical environment

Why energy from the sun is the initial energy source for nearly all ecosystems of Earth

The effects of pollutants as substances with which ecosystems have had no prior evolutionary experience

#### Topics and Themes of Unit 1:

Exponential growth

Behavior's Heritable Basis

Communication Signals

Mutualism

Predation

Parasitism

Ecosystems

Biome

Global Air Circulation

Pollutants

Human Population Growth

### Unit 2—June 19, 26      Genetics and Evolution

This unit provides a basis for understanding the relation of genetic processes to the process of evolution, and describes the processes through which speciation can occur and how life could have originated.

Reading Assignments:

Starr, Chapters 8-11, 16-17

Weiner, Chapters 8, 12, 13

**Objectives for Unit 2**

Demonstrate an understanding of how and why the continuity of life depends on reproduction

Demonstrate an understanding of meiosis

Demonstrate an understanding of patterns of inheritance

Demonstrate an understanding of why each kind of gene has its own specific location in a particular type of chromosome

Demonstrate an understanding of cell differentiation

Demonstrate an understanding of speciation as the process by which daughter species evolve from a parent species

Topics and Themes of Unit 2:

Cell Division

Mitosis

Meiosis

Genetics

Chromosomes

Genetic Engineering

Microevolution

Speciaiton

Unit 3—July 3, 10    Evolution and Diversity

This unit addresses the topics of biodiversity and introduces the topic of mammalian immunity.

Reading Assignments:

Starr, Chapter 19, 21, 23-25

Weiner, Chapter 6, 20

**Objectives for Unit 3**

After completing this Unit, students will be able to demonstrate an understanding of:

Biogeography

Plant Tissues

The structure and formation of plants as adaptive responses to water and mineral concentrations

Plant reproduction

## Immunity

### Topics and Themes of Unit 3:

Macroevolution  
Plant Development  
Plant Nutrition

### Unit 4—July 17, 24 Molecular Evolution

This unit describes molecular events that contribute to genetic changes that are acted upon through natural selection to bring about evolution.

#### Reading Assignments:

Starr, Chapter 18, 1 (review)

#### Reading Review:

This is not required reading, but should be reviewed if the material is not familiar.

Starr, 21, 22, 23, 24, 28, 29, 32, 34

### **Objectives for Unit 4**

Explain the relationship between gene structure and protein structure

Explain how changes in amino acid sequence in proteins can change the three dimensional structure of the protein

Identify and explain the mechanisms by which new genes can be obtained in a species

Understand the proposed role of RNA in the origin of life

### Topics and Themes of Unit 4:

DNA Structure and Function

Protein Structure and Function

Role of the different forms of RNA in gene expression through protein synthesis

Effect of mutations on protein structure and function

Origins of Life