

## ENE 506 Ecology for Environmental Engineers

### Fall 2012 Course Syllabus

Class	Mondays	6:30-9:15pm	GFS 116
Professor	Matin Lackpour		
Office			
Phone	(818) 771-6756 Work — (661) 313-7112 Cell		
Email	lackpour@usc.edu		
Office Hours	Mondays 5:30-6:30 or by Appointment		
Teaching Assistant			
Email			
Prerequisites	Graduate standing		
Textbook	<i>Ecology</i> , by R.E. Ricklefs and G.L. Miller, W.H. Freeman and Company		
Supplemental books and materials:	Simon, E. J., Reece, J. B., & Dickey, J. L. (2010). <i>Essential biology with physiology</i> . (3rd ed.). San Francisco, CA: Pearson/Benjamin Cummings.		
	Additional Supplemental material on weekly basis		
Course Objectives	Students will learn the role of environmental engineering in maintaining stability of freshwater, marine, and terrestrial ecosystems; macroscopic plant and animal forms as indicators of water quality.		
Learning Objectives	This course provides students with basic theories of the workings of ecosystems, how they can be described, and how to detect, quantify, and ultimately mitigate environmental impacts.		

#### Synopsis:

ENE 506 examines the scientific and engineering aspects of the workings of ecosystems, how we can maintain the stability of freshwater, marine, and terrestrial ecosystems; macroscopic plant and animal forms as indicators of water, Air, and land use and the quality of them.

#### Course Outline and Schedule

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- Week 1**  
8-27-12     **Introduction: Describing and Understanding of the Ecosystem, Organisms and the Physical Environment**  
The Order of the Natural World  
Discovering the Order of Nature  
Life and the Physical Environment
- Week 2**  
9-3-12     **Holiday**
- Week 3**  
9-10-12     **Organisms and the Physical Environment Continued**  
Water and Solute Balance  
Energy and Heat  
Oil, gas, coal, and oil shale energy production  
Response to Variation in the Environment
- Week 4**  
9-17-12     **Organisms and the Physical Environment Continued**  
Biological Factors in the Environment  
Climate, Topography, and the Diversity of the Natural World  
Estimating steam power
- Week 5**  
9-24-12     **Energy and material (Trophic Dynamics)**  
The Ecosystem Concept  
Energy Flow in Ecosystem  
Pathways of Elements in Ecosystems  
Nutrient Regeneration in Terrestrial and Aquatic Ecosystem  
Regulation of Ecosystem Function
- Week 6**  
10-1-12     **Population Ecology**  
Population Regulation  
Distribution Analysis  
Population Growth  
Population
- Week 7**  
10-8-12     **Population Interactions**  
Resources and Consumers  
Competition Theory  
Lotka-Volterra Competition  
Metapopulations Competition
- Week 8**  
10-15-12     **Mid-Term**  
Field trip, Cabrillo Beach or Rancho Palos Verdes

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<b>Week 9</b>	<b>Community Ecology</b>
10-22-12	Herbivory and Parasitism Coevolution and Mutualism The Concept of the Community Structure of the Community Community Development Biodiversity
<b>Week 10</b>	<b>Evolution Ecology</b>
10-29-12	Evolution and Adaptation Adaptations to Heterogeneous Environments Evolution of Life Histories
<b>Week 11</b>	<b>Evolution and Social Behavior</b>
11-5-12	Sex Evolution and Social
<b>Week 12</b>	<b>Special Topics in Ecology and Environmental Engineering</b>
11-12-12	Special Topics
<b>Week 13</b>	<b>Review of the Course</b>
11-19-12	Key points of the course Topics for further studies Making best possible decisions with resources available Student presentations
<b>Week 14</b>	<b>Statistical Techniques Review</b>
11-26-12	<b>and student presentations</b>
<b>Week 15</b>	<b>Final Exam</b>
12-3-12	6:30 – 9:00 p.m.

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<b>Grading policy:</b>	Homework	20%
	Participation	15%
	Midterm Exam	20%
	Final Exam	25%
	Report & Field Trip	<u>20%</u>
	Total	100%

### Course Requirement Including Report and Presentation

Homework will be assigned each week and will be due one week later.

A midterm and final will be given. About one third of the grade value will be in short essay questions, and two thirds in problems. The final will be cumulative, but with some preference for material presented after the midterm.

Report / Paper: We will discuss this in more detail in our class. Samples will be provided.

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Field Trip: assessment of the impact of public use on rocky shore ecosystems at Cabrillo Beach.

#### **Statement for Students with Disabilities**

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

#### **Statement on Academic Integrity**

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *Scampus*, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A:

<http://www.usc.edu/dept/publications/SCAMPUS/gov/>.

Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at:

<http://www.usc.edu/student-affairs/SJACS/>.