LANDSCAPE ECOLOGY - ENTO/GEOG 625
Fall 2013
SYLLABUS

INSTRUCTORS: Robert N. Coulson,
Professor,
Department of Entomology

Maria Tchakerian
Associate Research Scientist
Knowledge Engineering Laboratory
Department of Entomology

OFFICE LOCATION: Heep Center 408
PHONE: 845-9725

E-MAIL: Coulson: r-coulson@tamu.edu
Tchakerian: mtchakerian@tamu.edu

LECTURE ROOM: HPCT: 205
LABORATORY ROOM HPCT: 205

TIME: Lecture (MW 10:20-11:10 PM)
Laboratory (TBA)

CREDIT HOURS 3

COURSE DESCRIPTION:
Landscape ecology is the study of structure, function, and change in a heterogeneous land area composed of interacting ecosystems. Fundamental principles of landscape ecology serve as the foundation for planning, problem solving, and decision making in land-use management. We will examine basic ecological principles dealing with landscape structure (components of the landscape and their linkages and configurations), function (quantities of flows of energy, materials, and species within and among landscape elements), and change (alteration in the structure and
function of the ecological mosaic over time). This examination will be conducted in the context of land-use management objectives. Tools and methodologies used for spatial analysis and description will be examined in the laboratory.

**COURSE GOAL:** To provide a synthesis of landscape ecological principles with an applied interpretation.

**EXPECTED LEARNING OUTCOME:** (1) A broad-based knowledge of the basic principles of landscapes ecology, (2) an understanding of the relationship between principles of landscape ecology and land-use management, and (3) an overview of tools and techniques for spatial description, analysis, and synthesis.

**FORMAT:** Class participation in discussion questions from *Basic Landscape Ecology* and reading assignments, practical laboratory exercises, and an engaged learning project.

**TEXT:**
Coulson, R. N. and Maria D. Tchakerian. *Basic Landscape Ecology*  
http://kelapbpartners.com  
Notes: Posted at http://kelab.tamu.edu/coulson/625lecture.asp

**GRADING:**
- Mid-term exam: 10%
- Final Exam: 25%
- Laboratory Exercises: 25%
- Class/individual engaged learning projects: 40%

**PREREQUISITES:** Permission of instructors.

**LANDSCAPE ECOLOGY – 2012**
"If I had ever learned, I would be a true proficient"  
(Pride and Prejudice).
AGENDA

BASIC
LANDSCAPE
ECOLOGY

Part I: Foundations of Landscape Ecology
- Basic Concepts: Landscape, Ecology, Landscape Ecology
- Organization of the Knowledge Base for Ecology
- Spatial and Temporal Scale
- The Ecosystem Concept
- The Landscape in Ecology
- Landscape in Art, Geography, and Landscape Architecture

Part II: The Substance of Landscape Ecology
- Landscape Structure
- Landscape Function
- Landscape Change
- Analysis and Synthesis
LANDSCAPE ECOLOGY LABORATORY (ENTO/GEOG 625)

GOAL: To provide an overview of tools and techniques for landscape description, analysis, and synthesis.

Laboratory exercises are primarily computer-based, and contained entirely within your lab readings. The entire chapter describing the assigned lab exercise should be read before coming to lab. Each lab has a two-hour time slot available to work on your labs. Some labs may require more time than this and you are expected to do the work outside of class if needed. All lab reports must be typed, unless otherwise indicated. When writing up the labs, do not use one-word responses. Each question should be answered so that it is clear what your response means. The due date for each lab assignment will be indicated on each lab.

NO LATE LABS WILL BE ACCEPTED

LAB REPORTS: Lab exercises will be completed during the lab period and reports will be completed outside class. Detailed instructions will be given at the beginning of each lab. Written lab reports should be typed. Please use the following general format:

1. Your name
2. Date
3. Chapter # (Title of lab)
4. Introduction- Two or three sentences describing the main objective of the exercise, in your own words.
5. Questions-
   - Number each assigned question and give your answer.
   - You do not need to type the question in your report.
6. **Summary**- Two or three sentences summarizing the main results of the exercise.

7. **Attachments**- Some labs may have graphs or figures that you can include with your report.

**TOPICS (SUBJECT TO CHANGE):**

**Lab 1.** The Fishing Trip: An Introduction to the Process of Decision-making.

**Lab 2.** Introduction to Geographic Information Systems (GIS)

**Lab 3.** Corridors, Stepping Stones, and Butterflies

**Lab 4.** Simulating Changes in Landscape Pattern

**Lab 5.** Quantifying Landscape Pattern: Understanding Landscape Metrics I

**Lab 6.** Modeling Ecological Processes

**Lab 7.** Animal Movement

**Lab 8.** Risk Assessment
GRADING: The following rubric will be used to grade reports.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
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</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>Summarizes main goal, results and conclusions; short (&lt;300 words) and concise; includes summary statement explaining what was learned.</td>
<td>Summarizes main goals, results, and conclusions; short; includes summary statement.</td>
<td>Summarizes main goals, results and/or conclusions; may include summary statement.</td>
<td>Does not summarize main goals/results/conclusions; no summary statement.</td>
</tr>
<tr>
<td>Score: 2</td>
<td>Score: 1</td>
<td>Score: 0.5</td>
<td>Score: 0.5</td>
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<tr>
<td>Introduction</td>
<td>Clearly states goals of the lab; includes detailed information about relevant ecological concepts.</td>
<td>States goals of the lab; includes information about ecological concepts.</td>
<td>States goals of the lab/ includes information about ecological concepts.</td>
<td>Neither states goals of the lab nor includes information about ecological concepts.</td>
</tr>
<tr>
<td>Score: 2</td>
<td>Score: 1</td>
<td>Score: 0.5</td>
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<tr>
<td>Methods</td>
<td>Provides detailed account of methods used; repeatable instructions; does not include results.</td>
<td>Provide account of methods used and instructions; does not include results.</td>
<td>Vague account of methods used; little or no useful instructions; no results.</td>
<td>No method section.</td>
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<tr>
<td>Score: 2</td>
<td>Score: 1</td>
<td>Score: 0.5</td>
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<tr>
<td>Results¹</td>
<td>States results from experiment without discussion.</td>
<td>States results from experiment with discussion.</td>
<td>States results vaguely.</td>
<td>No result section.</td>
</tr>
<tr>
<td>Score: 2</td>
<td>Score: 1</td>
<td>Score: 0.5</td>
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<tr>
<td>Diagrams &amp;</td>
<td>Diagrams and illustrations and add to the reader's understanding of the topic.</td>
<td>Diagrams and illustrations are accurate and add to the reader's understanding of the topic.</td>
<td>Diagrams and illustrations are neat and accurate and sometimes add to the reader's understanding of the topic.</td>
<td>Diagrams and illustrations are not accurate/ do not add to the reader’s understanding of the topic.</td>
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<tr>
<td>Illustrations</td>
<td>Score: 2</td>
<td>Score: 1</td>
<td>Score: 0.5</td>
<td>Score: 0</td>
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<tr>
<td>Discussion</td>
<td>Information clearly relates to the main topic. It includes several supporting details and/or examples.</td>
<td>Information relates to the main topic. It provides 1-2 supporting details and/or examples.</td>
<td>Information relates to the main topic. No details and/or examples are given.</td>
<td>Information has little or nothing to do with the main topic.</td>
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<td>Score: 10</td>
<td>Score: 8</td>
<td>Score: 6</td>
<td>Score: 4</td>
<td></td>
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ENGAGED LEARNING PROJECT (ENTO/GEOG 625)
Engaged learning is essentially practical problem-solving. General resources on the approach are listed below. The main requirements for using engaged learning involve defining an authentic problem and solution procedure. The basic steps are as follows: (i) problem definition, (2) proposal development (which includes the solution pathway), (3) investigating the problem, and (4) reporting the results of the investigation. The rubric above will be used to evaluate reports. Topics for the engaged learning projects will be developed by the class based on interest. The projects can be group or individual.

1. Website of general information and examples:
   http://ozpk.tripod.com/000engaged
2. Indicators of engaged learning:
   http://www.rmcdenver.com/useguide/assessme/engaged.htm
3. Evaluating engaged learning:
   http://www.siue.edu/~jandris/engaged/engaged.html
4. Engaged learning homepage:
   http://ed.fnal.gov/lincon/el_homepage.shtml