Landscape Ecology
NREM 691-001 Advanced Topics in Nat. Resources & Environmental Management
3 Credits
Fall 2009

Instructor:  Dr. Christopher A. Lepczyk

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Phone Number:  956-2617
E-mail address:  lepczyk@hawaii.edu

Class Schedule:  Mondays and Wednesdays 3:00-4:15 PM.  St. Johns 15
Office Hours:  By appointment

Required Texts:

Optional Texts:

Books are available at the University of Hawai'i Bookstore in the Campus Center or any on-line bookstores (e.g., amazon.com; abebooks.com, etc). The latter source may be much cheaper.

Supplemental Readings:  Supplemental readings from the primary literature will regularly be provided by the instructor over the course of the semester (either online or in class) as appropriate. Most weeks readings will come from both the required books and the supplemental readings.

Programmatic Fulfillment:  This class counts toward NREM graduate credit, elective graduate credit, and meets the requirement for the 'ecology' course in the Ecology, Evolutionary Biology, and Behavior (EECB) program.
READ THIS INFORMATION CAREFULLY. YOU ARE RESPONSIBLE FOR ALL INFORMATION AND DEADLINES IN THIS HANDOUT.

Course Description:
Landscape ecology is typically described as ‘the effect of pattern on process.’ Over the course of the semester, this graduate level course will discuss the history, theoretical underpinnings, and contemporary views of landscape ecology. Topics will include, but are not limited to, scale and hierarchy theory, land cover and land use, the role of remote sensing and GIS for landscape analysis, landscape metrics, disturbance regimes and disturbance ecology, land tenure and management, landscape change, the relationship of landscapes to species distributions and abundances, landscape modeling, and cultural landscapes. Landscape ecology is inherently interdisciplinary and integrates broadly across the physical and social sciences.

Course Objectives:
Upon completion of the course the successful student will be able to:
1. Define landscape ecology and discuss its relationship with other disciplines (if it is a discipline—to which I will leave to you to argue).
2. Define, differentiate, and be fluent in the terminology of landscape ecology (e.g., what is the difference between land use and land cover?)
3. Understand the historical rise of landscape ecology from geographical and botanical perspectives through contemporary views.
4. Understand how landscapes change over time and across space.
5. Discuss the major people and theories that have shaped our knowledge about landscape ecology.
6. Understand and discuss how to study landscapes in the context of basic science, natural resource management, urban and landscape planning, and conservation.
7. Understand and discuss how landscape ecology can be used in Hawai’i, and what the pros and cons are of it on an island archipelago.
8. Read and understand primary literature in landscape ecology
9. Understand and perform basic applications of landscape ecology
10. Make scientifically informed decisions about ecological, societal, and natural resources issues related to landscapes.

Prerequisites: There are no prerequisites for this course, aside from graduate standing (or permission of the instructor). However a solid understanding of basic science and math will facilitate your learning, especially such courses as ecology (or subdisciplines of ecology), physical geology (geomorphology), cartography, geographic information systems, land use planning, natural resource management, and statistics.
Grading

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range (%)</th>
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<tbody>
<tr>
<td>A</td>
<td>94-100</td>
<td>B-</td>
<td>80-83</td>
<td>D+</td>
<td>67-69</td>
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<tr>
<td>A-</td>
<td>90-93</td>
<td>C+</td>
<td>77-79</td>
<td>D</td>
<td>60-66</td>
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<tr>
<td>B+</td>
<td>87-89</td>
<td>C</td>
<td>74-76</td>
<td>F</td>
<td>&lt;60</td>
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<tr>
<td>B</td>
<td>84-86</td>
<td>C-</td>
<td>70-73</td>
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Completing all of your assignments and turning them in on time will facilitate your success in this class! All grades follow the grading standard above and no curve will be used for this course. Assignments turned in after the due date will be marked down one letter grade per day late. The final course grade will be broken down based upon the following percents:

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Percent</th>
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<tbody>
<tr>
<td>2 take home exams (20% each)</td>
<td>40%</td>
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<tr>
<td>Participating and leading discussions</td>
<td>20%</td>
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<tr>
<td>Lab exercises and homework</td>
<td>40%</td>
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Exams

Two take home exams will be given over the course of the semester. Both exams will be structured as short answer and/or essays that seek for you to synthesize all of the material covered in the course up until that point. It is expected that you will cite primary literature in the exams, draw figures, create tables, and be able to discuss the questions in a philosophical manner similar to the kinds of questions that arise during graduate oral and/or written comprehensive exams and defenses. You will be given the assignments at least one week before they are due and have a minimum of 72 hours to work on the assignments. The work is expected to be your own product.

Participating and Leading Discussions

Participating

In preparing to become professional scientists, managers, or practitioners upon graduation it is imperative to be well versed in reading and interpreting the primary literature (i.e. peer-reviewed journal articles, books, and technical reports). One of the best opportunities to become well versed in reading and interpreting the literature is through class discussions. However, class discussions are only effective when all students have prepared and contribute. Lack of participation can seriously jeopardize your grade! All students are expected to have read the assigned paper(s) before class and given thought to their content and context. Two to four papers will be assigned on a weekly basis and will come from both the Foundations text and other primary literature sources, based upon specific students interests.

A few helpful suggestions to prepare for discussions are as follows. First, skim the paper to get an idea of the content. Second, ask yourself the following basic questions: What are the major goals, objectives, and questions/hypotheses being investigated?
What are the methodological approaches? Was the study conducted in a logical or scientifically sound manner? Are the data of high quality? Did the author(s) interpret the results correctly? Third, if there are terms that you do not understand, look them up (it is absolutely critical to be independent and learn to teach yourself in graduate school)! Fourth, and most importantly, write down questions and observations about the paper during and following your reading of it. Scientific literature is never quick and simple to read, but it does become much easier the more you read. Remember, if you do not understand something that we read in class it is very likely that others had the same problem, which is one of the points of having discussions.

Being prepared for discussions will benefit everyone tremendously as we have diverse interests and backgrounds among the students, and we all learn a lot by listening to one another!

**Leading**

Each student will be responsible for leading one class discussion over the course of the semester. As the discussion leader you will need to have thoroughly read all the assigned readings and give an initial brief overview of the papers. Here are several tips on preparing to lead discussions:

- Write down a short summary of the papers for yourself.
- Be prepared to define terminology that may be unknown to the students.
- Create a set of questions to ask the class. Because we will be reading both foundational (i.e. classic) and contemporary papers in landscape ecology, the basic questions will likely vary, but could include ones such as: 1) What is/are the main conceptual contributions of the paper? 2) Why might the paper be influential or important to landscape ecology? 3) How does the paper relate to material covered in lecture or in other papers? 4) Does the paper propose a new direction, method, or theory? 5) How does the paper impact or relate to landscape ecology.
- Prepare open-ended questions that will create discussion and dialog. Questions that have ‘yes’ or ‘no’ answers generally do not facilitate discussion.
- Feel free to call on people if there is silence. Remember, you are the leader and it is your job to facilitate the discussion.
- Make sure to include all members of the class in the discussion. This means that you may need to call on the quiet individuals and redirect or remind dominate students to give others a chance.
- If the discussion goes too far off subject or hits a dead end, be prepared to redirect it.
- Try to summarize and/or synthesize the material as you go along. This might include writing down major points on the board (or computer), creating graphs/models.
- Consider creating a summarized document of the papers that you can share with the class at the end of the discussion.
Finally, to help grease the wheels of the mind during the late hour of the class, I would like to offer the following. On days of discussions I will bring in coffee for all students. If you would like to bring in snacks to go along with the coffee, each student can then take a turn.

**Lab Exercises and Homework**
Because the practice of landscape ecology often requires the use of a disparate array of tools, it is important that students gain exposure to them in the classroom. Thus, each week (barring a few exceptions) a lab assignment from the *Learning Landscape Ecology* text (or a separate computer software application) along with additional questions by the instructor will be handed out (approximately 13 labs). Depending upon your previous experience and works style, some labs will take longer than others. Specific instructions for each lab will be handed out as part of the assignment, but all should be type written and of professional quality.

**Attendance**
Attendance is expected, but not required. Remember, college is expensive and each class of Landscape Ecology you miss is like throwing away $44 if you're from Hawai'i or $97 if you're from out of state! Obtaining lecture notes or handouts missed due to absence is your responsibility. Discussions cannot be made up, so missing class can impact your participation component markedly.

**General Etiquette**
E-mail: Please remember that when e-mailing the instructor I may be unable to return your message immediately. However, barring extraordinary circumstances, I will reply within 24 hours. Furthermore, please remember appropriate etiquette when e-mailing me (e.g., please do not write “Hey you…”) and always use a subject line that includes the words NREM 691 for any message.

Cell Phones: Please turn off your cell phones in class as they are both disruptive and disrespectful of other students’ time. This includes texting. I will warn students once, but will subsequently ask students to leave the class if the problem persists.

**Cheating and Plagiarism**
Students caught cheating or plagiarizing will be given 0 points for the given assignment and will not be allowed to make-up the work. In addition the appropriate officials in the university will be notified. The official university definition of academic dishonesty is: “Cheating includes but is not limited to giving or receiving unauthorized assistance during an examination; obtaining unauthorized information about an examination before it is given; submitting another’s work as one’s own; using prohibited sources of information during an examination; fabricating or falsifying data in experiments and other research; altering the record of any grade; altering answers after an examination has been submitted; falsifying any official University record; or misrepresenting of facts in order to obtain exemptions from course requirements.
Plagiarism includes but is not limited to submitting, in fulfillment of an academic requirement, any work that has been copied in whole or in part from another individual's work without attributing that borrowed portion to the individual; neglecting to identify as a quotation another's idea and particular phrasing that was not assimilated into the student's language and style or paraphrasing a passage so that the reader is misled as to the source; submitting the same written or oral or artistic material in more than one course without obtaining authorization from the instructors involved; or "drylabbing," which includes obtaining and using experimental data and laboratory write-ups from other sections of a course or from previous terms.”

Teaching Philosophy
My teaching philosophy is based upon four basic principles of what it means to be an outstanding teacher.

- First, any subject, no matter how complex, can be learned by any student if the professor is a good teacher.
- Second, an excellent teacher is creative, enthusiastic, interactive, and takes time to understand his/her students.
- Third, excellent teachers push students to their full potential through communication of high expectations.
- Fourth, an excellent teacher strives to continue his/her own education in order to give students the newest and broadest base of knowledge and the best integration between disciplines.

When a teacher embodies this philosophy, then the sky is the limit for any student.

Six guidelines on how you can succeed in this course
1. Attend class regularly.
2. Read all assigned and supplemental readings.
3. Ask questions.
4. Keep your notes and course related material in an organized system. I suggest a three-ring binder.
5. Plan on spending three to four hours working on the course outside of the classroom for every hour that is spent in the classroom as a minimum. This means that you should budget nine to twelve hours each week for the class.
6. Come to office hours or talk with instructor.

Because this course is at the graduate level it is expected that students are comfortable reading, writing, speaking in class, and managing their time well. Hence, the course is not designed to nitpick students’ abilities in spelling, grammar, attendance, etc. Instead the course is designed for you to move towards a self-learner and gain the skills necessary to be successful as a professional when you graduate.
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics and Assignments</th>
<th>Readings</th>
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<tbody>
<tr>
<td>1</td>
<td>Aug. 24</td>
<td>Course Overview</td>
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<tr>
<td></td>
<td>Aug. 26</td>
<td>Introduction to landscape ecology and landscape definitions</td>
<td>Text: Preface, Ch. 1 Foundation papers: Intro through Sauer</td>
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<tr>
<td>2</td>
<td>Aug. 31</td>
<td>Background continued; select class discussion leaders by date</td>
<td>Foundation papers: Troll, and Watt</td>
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<td></td>
<td>Sept. 2</td>
<td>Scale and hierarchy</td>
<td>Text: Ch. 2</td>
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<tr>
<td>3</td>
<td>Sept. 7</td>
<td><strong>Labor Day—No Class</strong></td>
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<td></td>
<td>Sept. 9</td>
<td>Discussion (Dr. Lepczyk leads)</td>
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<td>4</td>
<td>Sept. 14</td>
<td>Causes of landscape pattern</td>
<td>Text: Ch. 4</td>
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<tr>
<td></td>
<td>Sept. 16</td>
<td>Discussion and continuation of week’s lecture topic</td>
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<td>5</td>
<td>Sept. 21</td>
<td>Quantifying pattern, remote sensing, GIS</td>
<td>Text: Ch. 5</td>
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<td>Sept. 23</td>
<td>Discussion</td>
<td></td>
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<tr>
<td>6</td>
<td>Sept. 28</td>
<td>Introduction to landscape models; neutral models</td>
<td>Text: Ch. 3, 6</td>
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<td></td>
<td>Sept. 30</td>
<td>Discussion</td>
<td></td>
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<tr>
<td>7</td>
<td>Oct. 5</td>
<td>Land use and land cover change, disturbance regimes and ecology</td>
<td>Text: Ch. 7</td>
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<td>Oct. 7</td>
<td>Discussion</td>
<td></td>
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<tr>
<td>8</td>
<td>Oct. 12</td>
<td>Interactions between organisms and the landscape; <strong>Take home exam 1 due</strong></td>
<td>Text: Ch. 8</td>
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<td>Oct. 14</td>
<td>Discussion</td>
<td></td>
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<tr>
<td>9</td>
<td>Oct. 19</td>
<td>Interactions between organisms and the landscape; ecosystem processes and landscapes</td>
<td>Text: Ch 9</td>
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<td>Oct. 21</td>
<td>Discussion</td>
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<tr>
<td>10</td>
<td>Oct. 26</td>
<td>Ecosystem processes and landscapes continued; land-water interactions</td>
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<td>Oct. 28</td>
<td>Discussion</td>
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11 Nov. 2 Landscape and land use planning
Nov. 4 Discussion

12 Nov. 9 Social and cultural dimensions of landscapes
Nov. 11 Discussion

13 Nov. 16 Social and cultural, approaches to managing landscapes, natural resources, and restoration
Nov. 18 Discussion

14 Nov. 23 Approaches to managing landscapes, natural resources, and restoration
Nov. 25 Discussion

15 Nov. 30 Monitoring, macroecology, climate change;
Dec. 2 Discussion

16 Dec. 7 Synthesis, linkages, and future directions
Dec. 9 Discussion

Dec. 14 **Take home exam 2 due by 3:00 PM**

Please note that all topics are tentative and may change slightly in terms of when presented.