Introduction:
What one sees out the window of an airplane is a landscape. It can be described in terms of its shape, form and pattern. It may be a forest matrix with patches of rural residences, or a suburban matrix with patches of woodland. Landscape ecology is an interdisciplinary field that focuses on this landscape scale, and relates patterns, as described above, with landscape processes....How do wildlife species live and move through the landscape? How do rainwater and nutrients move across the landscape? How do people perceive and manage these landscape patterns? The relationship of landscape pattern to process is fundamental to landscape ecology, and also to landscape planning and design.

This course in applied landscape ecology will explore the structure, function and dynamic processes which form and operate in landscapes, at multiple scales and in diverse contexts. This exploration will be aimed at the theoretical, technical and strategic knowledge that influences landscape planning, design, and management decisions-in support of the globally-accepted concept of sustainability. The course will cover basic theories from ecology, conservation biology, landscape ecology, and landscape and physical planning. The course is intended mainly for students majoring in: Landscape Architecture, Regional Planning, Environmental Science, Natural Resource Studies, and Environmental Design. Students from other majors are also encouraged and welcomed to take the course. There are no specific prerequisites.
Course Goal: After learning basic principles of earth sciences, biology, cultural anthropology, and landscape ecology, to develop an understanding of the structure, function and dynamic processes of landscapes and apply this knowledge to land use planning, design and management decisions that can contribute to a sustainable condition.

Learning Objectives:
• To be able to analyze and synthesize information on the physical, biological and cultural processes that produce and define landscapes and how these can be influenced through planning, design and management.
• To be able to anticipate the effects/impacts of a proposed intervention in the landscape.
• To understand how cultural attitudes and values reflect, and are reflected within, landscapes.
• To develop a personal ethical perspective on landscape planning, design and management informed by landscape ecological theory and principles.
• To learn how principles of sustainability affect and are affected by design considerations.


Course Reader: A compilation of journal articles and book chapters to supplement the main text. To be available under: LA 547 Landscape Pattern and Process/Ahern at Copy Cat Print Shop, East Pleasant Street, Amherst.

Requirements/Grading:
First Hour Exam 20%
Second Hour Exam 20%
Final Exam 30%
Independent Project 15%
Lab Exercises 15%

Exams:
First Hour Exam October 6, in class.
Second Hour Exam, November 8, in class.
Final Exam: to be scheduled during* the University Final Exam Period, Dec. 16-22.

*Please do not make plans to leave the area before the date of the exam is known and announced, usually by mid November.

Independent Project: Mill River Watershed: Portfolio for this assignment you are to organize and present a compilation of mapped, text, photographic and numerical information to describe and interpret the Mill River Watershed. You are encouraged to use photographs taken during field trips (hint), GIS Maps produced in lab, as well as materials from lab exercises.
THREE MAIN COMPONENTS OF MILL RIVER PORTFOLIO PROJECT:

1. Your portfolio should include basic information/data/images to describe and analyze the landscape pattern of the watershed, how many acres? Land use types, percentages? Forest types? Amount of urbanization?, etc.

2. Then you should assess the function or “process” of the landscape, what are the current processes that are not operating? Are they operating sustainably? Hydrology? Water Quality? Wildlife habitat? Land use change? Community character? Which processes are functioning better? What are the problems?

3. Finally you are expected to make at least three specific recommendations, based on your analysis, and integrating concepts from the course, including strategic recommendations and site-specific recommendations. Which are the major issues facing the watershed? How did you reach this conclusion? (discuss, back up) What strategies or practices can you recommend to addresses these problems? Note: a "plan" is not expected, your recommendations may be directed to specific locations, or they may be more general - depending on their specific nature. Some details:
   - The size/format standard 8.5” * 11”
   - Graphic design and layout are important
   - Well-organized (title page, table of contents, bibliography, web-bibliography, etc)
   - Quality of images is important (maps, diagrams, photos)
   - Text should be well written, and proofread
   - Individual effort only, no team projects
   - The portfolio should address the three main themes described above
   - Due on last day of class, December 13
   - Will be accepted with penalty until the final exam
   - Not accepted thereafter without a prior permission from the instructor.
WEEK 1
Sept. 8: Lecture Topic: Course Introduction

Lab: No Labs this week.

WEEK 2
Sept. 13, Lecture Topic: Perspectives on Landscape Ecology
Chapter 1 “The Landscape Concept” pp. 1-17, Ch 4 “Landscape Pattern and Chorology”, 51-59

Sept. 15, Lecture: Geology and Geomorphology
Readings: Online Course, Okanagan University College, British Columbia, Canada, Course:
“Fundamentals of Physical Geography”
Chapter 10 “Introduction to Geology” (all sections a-p)
http://www.geog.ouc.bc.ca/physgeog/contents/chapter10.html
Chapter 11 “Introduction to Geomorphology” all sections (a-r) except e and f (will be covered later)
http://www.geog.ouc.bc.ca/physgeog/contents/chapter11.html

Lab: Map reading, symbols, scales, meet in Hills, Junior Studio, Second Floor, 8:35 am.

WEEK 3
Sept 20, Lecture: Geology and Geomorphology
Readings: Read all web pages that follow from: Connecticut River Geology
http://www.bio.umass.edu/biology/conn.river/geology.html

Sept 22, Lecture: Hydrology 1
Chapter 1 “Introduction”, pp. 1-16.

Lab: Mill River Geology, NEED DRIVERS/CARPOOL, meet at Hills 8:00 am. Be prepared for
weather.
WEEK 4
Sept 27, Lecture: Hydrology 2

September 29, Lecture, Stormwater Management
Readings: Ferguson, B. Intro to Stormwater, Ch. 1 “Stormwater and Environment”, pp. 1-12; Ch. 2 “Stormwater and Human Experience”, pp. 13-29.

Lab: Hydrology Field Trip, NEED DRIVERS/CARPOOL, meet at Hills 8:00 am. Be prepared for weather.

WEEK 5
Oct 4, Lecture: Wetlands

October 6: First Hour Exam, covering all lecture and readings to date.

Lab: GIS Lab 1: ArcView Introduction

WEEK 6
Oct 11, Lecture: Soils
Readings: Soil Science Simplified, H. Kohnke and D. P. Franzmeier. Chapters 1-4 (pp 1-32)
Online Course, Fundamentals of Physical Geology:
Soil Pedogenesis http://www.geog.ouc.bc.ca/physgeog/contents/11d.html
Soil Classification www.geog.ouc.bc.ca/physgeog/contents/11f.html

Oct 13, Lecture: Soils
Readings: Soil Science Simplified, H. Kohnke and D. P. Franzmeier. Chapters 7-9, (pp 61-104)
Online Course, Fundamentals of Physical Geology: Soil Classification
http://www.geog.ouc.bc.ca/physgeog/contents/11e.html

Lab: Soils, Orchard Hill, NO DRIVERS NEEDED, meet at Hills at 8:00 am. Be prepared for weather.
WEEK 7
Oct 18, Lecture: Ecological Principles

Oct 20, No Lecture, please attend the LARP Mid-Semester presentations

Lab: No Labs this week, LARP mid-semester presentations

WEEK 8
Oct 25, Lecture: Biodiversity and Conservation Biology

Oct 27, Lecture: Patches, Edges and Boundaries

Lab: Stream Biota, NEED DRIVERS/CARPOOL, meet at Hills 8:00 am. Be Prepared for weather.

WEEK 9
Nov 1, Lecture: Corridors and Connectivity

Nov 3, Lecture: Mosaics and the Matrix

Lab: Forest Ecology, Walk to Orchard Hill, NO DRIVERS NEEDED, meet at Hills at 8:00 am. Be prepared for weather.
WEEK 10
Nov 8, Second Hour Exam

Nov 10, Lecture: Land Transformation and Fragmentation

Lab (Thursday Only) : Ecology and Land Use History, Fisher Museum, Harvard Forest, Petersham, MA. NEED DRIVERS/CARPOOL, meet at Hills 8:00 am. Be prepared for weather.

WEEK 11
Nov 15, Lecture: Culture and Landscape Ecology

Nov 17, Lecture: Landscape Planning

Lab: Arc View Lab 2

WEEK 12
Nov 22 , Lecture: Greenways as a Planning Strategy

Nov 24, Thanksgiving HOLIDAY

Lab: (Tuesday Only) Ecology and Land Use History, Fisher Museum, Harvard Forest, Petersham, MA, DRIVERS NEEDED / CARPOOL, meet at Hills 8:00 am. Be prepared for weather.

WEEK 13
Nov 29, Lecture: Regenerative Design
Also please read: About the Lyle Center, at: [www.csupomona.edu/~crs/](http://www.csupomona.edu/~crs/)

Dec 1, Lecture: Ecological and Sustainable Design.  

Lab: Land development processes and impacts, NEED DRIVERS/CARPOOL Meet at Hills 8:00 am. Be prepared for weather

WEEK 14
Dec 6, Ecological and Sustainable Design 2. (Thompson and Sorvig, LEED)
Dec 8, No Lecture, Final Presentations
No labs this week

WEEK 15
No Labs this week

WEEK 16
Final Exam Period Dec. 16-22
Please do NOT make plans to leave the area before the final exam schedule is announced (Usually by mid November)