Introduction:
“A landscape is what one sees out the window of an airplane” (R. Forman). 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 landscapes, and relates patterns, as described above, with landscape processes.
How do wildlife species live and move through a particular landscape?
How do rainwater and nutrients move across the landscape?
What are the consequences of these movements, and how can they be managed for sustainability?
How do people perceive and manage landscape patterns?
How does a landscape reflect the values and preferences of its inhabitants?
The relationship of landscape pattern to process is fundamental to landscape ecology, and also to landscape planning and design. Think about it. Every physical plan and design influences the pattern of landscapes (more paving, slopes, lands uses, forests, roads, parks....) and changes in pattern influence processes, it is axiomatic and fundamental to what planners and designers do – hence the course name.

This course in applied landscape ecology will explore the structure, function and dynamic processes which form and operate in landscapes, at multiple scales, in diverse contexts, and
over time. We will always keep one, or both, eyes on sustainability – the global goal for humanity, and increasingly the watchword and *modus operandi* of progressive planning and landscape architecture. This exploration will be aimed at learning the theoretical, technical and strategic knowledge that influences landscape planning, design, and management decisions - in support of sustainability. The course will begin with basic theories and principles from geology, soils science, hydrolology, ecology, conservation biology, landscape ecology, and landscape and physical planning. The course is designed for students majoring in: Landscape Architecture, Environmental Design, Regional Planning, Environmental Science, and Natural Resource Studies. Students from other majors are also encouraged and welcomed to take the course. There are no specific prerequisites.

**Course Goal:** After learning selected basic principles of earth sciences, biology, human ecology, and landscape ecology, to develop an understanding of the structure, function and dynamic processes of landscapes and learn to 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 (from a private property to a watershed) 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 planning and design considerations.


**Course Readings:** A compilation of readings (journal articles and book chapters) will supplement the main text. Available initially on the LA 547 SPARK website, then under ERESERVES through the DuBois UMass Library.

**Requirements/Grading:**

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<th>Requirement</th>
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<td>First Hour Exam</td>
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<td>Second Hour Exam</td>
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<td>Final Exam</td>
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<td>Independent Project</td>
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<td>Lab Exercises</td>
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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 late October.

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 lab 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 and percentages of area? Forest types? Amount of urbanization?

2. Then you should assess the function or “process” of the landscape, what are the current processes that are operating, or 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/issues?

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 for the project submission:
   - Size/format standard 8.5” * 11”
   - Graphic design and layout are important (cover, page design, illustrations)
   - Well-organized (title page, table of contents, bibliography, web-bibliography, etc)
   - Quality of images is important (maps, diagrams/sketches, photos)
   - Text should be well written (proofread please!)
   - Individual effort only, no team projects
   - The portfolio should address the three main themes described above (patterns, process, recommendations)
   - Due on the last day of class, December 13
   - Will be accepted with penalty until the final exam
   - Not accepted thereafter without prior permission from the instructor.
WEEK 1

Sept. 4: Course Introduction and Logistics

Sept. 6: Lecture Topic: Perspectives on Landscape Ecology

Lab: No Labs this week.

WEEK 2

Sept. 11, Lecture Topic: Lecture: Geology and Geomorphology
Readings: TBA

Sept. 13, 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

Lab: Map reading, symbols, scales, meet in Hills Lobby, 8:00 am.

WEEK 3

Sept 18, Lecture: Hydrology 1

Sept 20, Lecture: Hydrology 2

Lab: Mill River Geology, NEED DRIVERS/CARPOOL, meet at Hills 8:00 am. Be prepared for weather, and for walking through brush.
WEEK 4
Sept 25, 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.

September 27, Lecture: Wetlands

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

WEEK 5
Oct 2, First Hour Exam, covering all lecture and readings to date.

October 4: Lecture: Soils 1
Readings: Soil Science Simplified, H. Kohnke and D. P. Franzmeier. Chapers 1-4 (pp 1-32)

Lab: GIS Lab 1: ArcView Introduction

WEEK 6
Oct 9, No Class Monday Schedule

Oct 11, Lecture: Soils 2

Lab: Only Thursday Lab: Soils, Orchard Hill, NO DRivers NEEDED, meet at Hills at 8:00 am. Be prepared for weather and for walking through brush and weeds.

WEEK 7
Oct 16, Lecture: Ecological Principles

Oct 18, No Lecture, please attend the LARP Mid-Semester presentations

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

WEEK 8
Oct 23, Lecture: Biodiversity and Conservation Biology

Oct 25, Lecture: Patches, Edges and Boundaries

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

### WEEK 9

**Oct 30, Lecture: Corridors and Connectivity**


**Nov 1, 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 6, Second Hour Exam**

**Nov 8, Lecture: Land Transformation and Fragmentation**


Labs Tuesday: Soils, Orchard Hill, NO DRIVERS NEEDED, meet at Hills at 8:00 am. **Be prepared for weather and for walking through brush and weeds.**

Labs Thursday: Ecology and Land Use History, Fisher Museum, Harvard Forest, Petersham, MA. NEED DRIVERS/CARPOOL, meet at Hills 8:00 am. Some outside walking, **Be prepared for weather.**

### WEEK 11

**Nov 13, Lecture: Culture and Landscape Ecology**


**Nov 15, Lecture: Landscape Planning**

Fabos, Julius, Gy. Ch. 8 “Land-Use Planning in Metropolitan and Rural Regions” pp. 127-150. in Land Use Planning: From Global to Local Challenge.

Lab: ArcView Lab 2

WEEK 12

Nov 20, Lecture: Greenways as a Planning Strategy

Nov 22, 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 27, Lecture: Regenerative Design
Also please read: About the Lyle Center, at: www.csupomona.edu/~crs/

Nov 29, 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, No Lecture, Final Presentations

No labs this week

WEEK 15


No Labs this week

WEEK 16
Final Exam Period Dec. 17-22
Please do NOT make plans to leave the area before the final exam schedule is announced (by mid November)