Instructor Information

Instructor: Audrey Mayer, Ph.D., Assistant Professor
Teaching Assistant: Azad Henareh Khalyani (ahenareh@mtu.edu)
Office Location: Noblet, Horner Hall 184
Telephone: Office 1- (906)487-3448
E-mail: almayer@mtu.edu
Office Hours: Mayer: 3:30-4:30pm MW; Henareh: 4-5pm T/W

Course Identification

Course Number: FW4380
Course Name: Landscape Ecology
Course Location: Noblet Forestry Building Rm. 146
Class Times: MWF 10:05 – 10:55
Prerequisites:

Course Description/Overview

Landscape ecology is the study of spatial patterns caused by ecological processes at multiple temporal and spatial scales. These patterns can be used to understand fundamental ecological processes, to monitor the effects of human activities on ecosystems, and to predict the effectiveness of conservation efforts, sustainable resource management, and regional planning. Although there will be lectures in the first part of the course, the course is designed to be largely self-taught through your readings, homework, and preparations for class participation. For this reason, grades will consist of 8 homework assignments, a class journal, a team literature presentation, class participation and attendance, and one 10-page research paper. Each student will choose a research topic, focused on a landscape-scale issue within an area related to their major or thesis research, which I must approve early in the semester.
**Course Learning Objectives**

By the end of the course, students should understand:

1. the basic principles of landscape ecology, particularly the importance of scale;
2. how to use the quantitative tools available to study landscape-scale patterns and processes; and
3. how to apply these principles and tools to real-world conservation, resource management, and planning issues.

**Course Resources**

**Course Website(s)**

- Canvas <https://mtu.instructure.com/courses/230514>
- Personal Website <http://www.mtu.edu/forest/about/faculty/mayer/>

**Required Course Text**


**Grading Scheme**

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage</th>
<th>Grade points/credit</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93% &amp; above</td>
<td>4.00</td>
<td>Excellent</td>
</tr>
<tr>
<td>AB</td>
<td>87% – 92%</td>
<td>3.50</td>
<td>Very good</td>
</tr>
<tr>
<td>B</td>
<td>82% – 86%</td>
<td>3.00</td>
<td>Good</td>
</tr>
<tr>
<td>BC</td>
<td>76% – 81%</td>
<td>2.50</td>
<td>Above average</td>
</tr>
<tr>
<td>C</td>
<td>70% – 75%</td>
<td>2.00</td>
<td>Average</td>
</tr>
<tr>
<td>CD</td>
<td>65% – 69%</td>
<td>1.50</td>
<td>Below average</td>
</tr>
<tr>
<td>D</td>
<td>60% - 64%</td>
<td>1.00</td>
<td>Inferior</td>
</tr>
<tr>
<td>F</td>
<td>59% and below</td>
<td>0.00</td>
<td>Failure</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete; given only when a student is unable to complete a segment of the course because of circumstances beyond the student’s control. A grade of incomplete may be given only when approved in writing by the department chair or school dean.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>Conditional, with no grade points per credit; given only when the student is at fault in failing to complete a minor segment of a course, but in the judgment of the instructor does not need to repeat the course. It must be made up within the next semester in residence or the grade becomes a failure (F). A (X) grade is computed into the grade point average as a (F) grade.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Grading Policy
Grades will be based on the following:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 page research paper</td>
<td>200</td>
</tr>
<tr>
<td>Peer review of research papers</td>
<td>20</td>
</tr>
<tr>
<td>8 homework assignments (20 points each)</td>
<td>160</td>
</tr>
<tr>
<td>Class journal</td>
<td>100</td>
</tr>
<tr>
<td>Class attendance/participation</td>
<td>200</td>
</tr>
<tr>
<td>Team literature presentation</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total Points</strong></td>
<td><strong>780</strong></td>
</tr>
</tbody>
</table>

Late Assignments
A late assignment loses 10% of the highest possible grade for each day it is late (“day” includes Saturday and Sunday). For example, if the assignment would have received a 95% if it were turned in on time, if it is turned in a day late is will receive an 85%. This penalty will be waived if students notify me prior to the deadline of potentially late assignments... and the reason must be unavoidable!

Collaboration/Plagiarism Rules
Unless explicitly instructed, homework assignments are to be completed individually, with no help from or discussions with other students. We will use the homework assignments as springboards for discussion in class, and therefore we need a variety of viewpoints and ideas. Research papers are to be completed individually, although discussion with classmates is acceptable and encouraged.

Out of consideration for your classmates, cell phones, Blackberries, iPods, PDAs, or any other electronic devises are not to be used in the classroom, and must be shut off. Information exchanges on these devices during class are also prohibited and violate the Academic Integrity Code of Michigan Tech.

University Policies
Academic regulations and procedures are governed by University policy. Academic dishonesty cases will be handled in accordance the University's policies.

Academic Integrity:
http://www.studentaffairs.mtu.edu/dean/judicial/policies/academic_integrity.html

If you have a disability that could affect your performance in this class or that requires an accommodation under the Americans with Disabilities Act, please see me as soon as possible so that we can make appropriate arrangements. The Affirmative Action Office has asked that you be made aware of the following:
Michigan Tech complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990. If you have a disability and need a reasonable accommodation for equal access to education or services at Michigan Tech, please call the Dean of Students Office, at 487-2212. For other concerns about discrimination, you may contact your advisor, department head or the Affirmative Action Office, at 487-3310

Disability Services:
http://www.admin.mtu.edu/urel/studenthandbook/student_services.html#disability

Michigan Tech is committed to providing a living, learning, and working environment that is free from harassment or discrimination based on race, religion, color, national origin, age, sex, sexual orientation, gender identity, height, weight, genetic information, marital status, ability, or veteran status. Michigan Tech prohibits any conduct that threatens or endangers the health or safety of any individual or group, including physical abuse, verbal abuse, threats, stalking, intimidation, harassment, sexual misconduct, coercion, and/or other communication or conduct that creates a hostile living, learning, or working environment. Any behavior that makes other students feel intimidated in this classroom will not be tolerated.

Affirmative Action:
http://www.admin.mtu.edu/aa0/

Equal Opportunity Statement:

Course Assignments

Research paper (200 points: 100 for the rough draft, 100 for the final)

This paper will be of a topic of your choosing, hopefully related either to your major and/or your thesis or dissertation research (if you are a graduate student). I am using the word “research” here a bit loosely; while I do expect you to formulate a hypothesis about which process(es) is responsible for a particular pattern (or patterns), I do not expect you to go out and collect data, run statistical or modeling tests, or other such activities (unless you really want to!). This will mainly be a thought exercise with plenty of peer-reviewed journal articles/reports to support your hypothesis. While you won’t end up with a definitive answer as to how that landscape pattern has come about, you will have a nice body of evidence to support your argument.

In this paper, you should dedicate significant space to describing how scale influences the creation and observation of this pattern. A brief discussion on hierarchy theory should be
included here, and indeed you should explicitly answer the “why?” and “so what?” questions with respect to your topic.

**Peer review of student papers (2 @ 10 points each)**

All students will be assigned two student draft papers to peer review (using the peer review form available on CANVAS). The point of this exercise is not only to help each other improve your papers, but also to learn from each other. Reviewing others’ writing allows you to practice putting yourself in the shoes of a reviewer, so that you can be more critical and insightful with your own writing.

**Homework assignments (160 points)**

While some concepts in landscape ecology are intuitive (especially for ecologists), others require some effort to understand. All of these concepts are meant not only for theoretical advancements, but also to be used in research and monitoring. The homework assignments will hopefully help you learn to apply these concepts to landscapes, and will be used throughout the first part of the class as fodder for in-class discussions. These assignments will be graded quite leniently (as the point of doing them is in the practice, not necessary to get the correct answer... when there is one!), however the lateness penalty is meant to be harsh; the assignments are to be done in conjunction with the lectures, and therefore you will get much less out of them (and the lectures and class discussions) if you are consistently behind schedule.

Some of these homework assignments are from the workbook “Learning Landscape Ecology: A practical guide to concepts and techniques” by Gergel and Turner. For now, since this class does not have a lab component (and I do not know the comfort level of students with statistics, GIS software, and remote sensing data), I did not put this book on the required reading list. However, for those of you who have had some statistics, GIS, and/or remote sensing already, and are interested in furthering your skills in applied landscape ecology practices, you may want to purchase the book for your own use as it comes with a data CD.

**Class journal (100 points)**

Each week, we will start a class session with a 10-minute in-class writing exercise. You will need a notebook or Blue Book for this. I will give you a short question to write about or reflect upon. At random points in the semester, I will collect these notebooks and read through them, partially to get a general sense of how the class is doing as a whole, and partially to see how individual students are mastering the material. I will repeat some of these questions or topics throughout the semester, so you can see how far your understanding has come since earlier in the semester. If you are absent on the day that this
question is given, please send me an email and let me know that you need the question, if a classmate doesn’t remember what it was.

**Team literature presentation (100 points)**

At the beginning of the semester, you will choose a teammate and the team will choose one article and one class period during which you will lead the class discussion on the article. You will pick a reading selection from three categories: Theory, Application, or Management.

The lectures and the Turner et al. textbook are designed to give you a foundation in landscape ecology that should help you fully understand these articles, which demonstrate how to use landscape ecology principles to develop theories, test applications, and design management options.

The team leading the class that day should come prepared with a brief presentation reviewing the major points of the article, specific points that are interesting or confusing, and armed with questions and topics for the class to discuss. Students who are not leading the class that day are responsible for reading the material prior to class and preparing to discuss it; this participation represents the majority of your attendance/participation points!

**Attendance and participation (200 points)**

**Attendance (100 points):** Students will receive two unexcused absences without any penalty. For each absence thereafter, students will lose 10 points.

**Participation (100 points):** These points will be given at my discretion; the scale goes something like this: if you speak up and participate in class discussions most of the time, you will get the full 100 points. If you speak so rarely that I don’t know what your voice sounds like, you will get 30 or fewer points.
Course Schedule

9 January: Introduction to the course

11 January: Lecture: Introduction to Landscape Ecology; Intro to GIS/HW#1 (Henareh)
Reading: Chapter 1, Turner et al.

13 January: Lecture: Landscape patterns
Reading: Chapter 4, Turner et al.

16 January: NO CLASS (Martin Luther King Jr. Day)

18 January: Lecture and discussion: Landscape patterns
HOMEWORK #1 DUE IN CLASS (HW#1 Introduction to GIS)

20 January: Lecture: Landscape quantification and metrics

23 January: Talk about potential research topics
Reading: Chapter 2, Turner et al.

25 January: Lecture: Scale
Reading: Chapter 5, Turner et al.

27 January: Lecture: Models and modeling software
HOMEWORK #2 DUE IN CLASS (HW #2 Scale 1)

30 January: Discuss Models and modeling software, HW #4 (Henareh)
Reading: Chapter 3, Turner et al.

1 February: Lecture: Neutral landscape models
HOMEWORK #3 DUE IN CLASS (HW #3 Metric 1)

3 February: Discussion about models and modeling
EMAIL TO PROF REGARDING RESEARCH TOPIC DUE

6 February: Lecture: Disturbances
Reading: Chapter 6, Turner et al.

8 February: Lecture: Disturbances
HOMEWORK #4 DUE IN CLASS (HW #4 Metric 2)

10 February: NO CLASS [Winter Carnival]

13 February: Lecture: Organisms and landscapes
Reading: Chapter 7, Turner et al.
15 February: Lecture: Organisms and landscapes

17 February: Discussion of organisms and landscapes, discussion of HW#6 (Henareh)
Reading: Chapter 8, Turner et al.
HOMEWORK #5 DUE IN CLASS (HW#5 Patterns)

20 February: Lecture: Ecosystem processes

22 February: Lecture: Ecosystem processes
Reading: Chapter 9, Turner et al.

24 February: Discussion of processes, HW#7 (Henareh)
HOMEWORK #6 DUE IN CLASS (HW#6 Disturbances and Organisms)

27 February: Lecture: Applied landscape ecology
Reading: Chapter 10, Turner et al.

29 February: Lecture: Applied landscape ecology and the landscape perspective
Reading: Chapter 11, Turner et al.

2 March: Wild China film exercise
HOMEWORK #7 DUE IN CLASS (HW#7 Scale 2)

5 March-9 March: NO CLASS (Spring Break)

12 March: Student team literature presentations (2)

14 March: Student team literature presentations (2)

16 March: Student team literature presentations (2)

19 March: Student team literature presentations (2)

21 March: Student team literature presentations (2)

23 March: Student team literature presentations (2)

26 March: Student team literature presentations (2)

28 March: Student team literature presentations (2)
DRAFT RESEARCH PAPER DUE TO PROF AND STUDENT PEER REVIEWERS

30 March: Student team literature presentations (2)
2 April: Student team literature presentations (2)

**REVIEWS DUE BACK TO AUTHORS**

4 April: Student presentations of research projects (3)

6 April: Student presentations of research projects (3)

9 April: Student presentations of research projects (3)

11 April: Student presentations of research projects (3)

13 April: Student presentations of research projects (3)

16 April: Student presentations of research projects (3)

18 April: Student presentations of research projects (3)

20 April: Last day of class (course evaluations - scantron and long form)

**FINAL DRAFT OF RESEARCH PAPER DUE**

**HOMEWORK #8 DUE IN CLASS (Course evaluation long form)**

NO FINAL EXAM!