

# **NRES 773: Applied Ecosystem Ecology and Management**

## **Spring Semester 2020 SYLLABUS**

### **Course Information:**

Entirely Online Course

Credits: 3

Readings, lectures, and assignments will be posted online and students are responsible to complete tasks as required.

### **Instructor Information:**

Dr. Kyle Herrman

Email: Kyle.Herrman@uwsp.edu (*preferred contact method*)

Office: 263 Trainer Natural Resources Building

Office Phone: 715-346-4832

### **Office Hours:**

Time: Thursday 10:00 am - 12:00 pm

Location: 263 Trainer Natural Resource Building

Or by appointment if the assigned hours do not work

### **Course Description:**

Investigate the flow of matter and energy through ecosystems, particularly focusing on carbon, nutrient, and tropic dynamics. Explore how humans have altered ecological processes and associated ecosystem services. Examination of ecosystem management through case studies.

Learning objectives:

- Understand the structure of basic terrestrial and aquatic ecosystems
- Describe the function ecosystems provide
- Describe how carbon and nutrients are cycled in various ecosystems
- Use ecological concepts to make sound management and/or restoration decisions

### **Required text:**

Chapin III, FS, Matson, PA, and PM Vitousek. 2011. Principles of Terrestrial Ecosystem Ecology, 2<sup>nd</sup> Edition. Springer, New York.

Dodds, WK. 2002. Freshwater Ecology, 1<sup>st</sup> Edition. Academic Press, San Diego.

## Academic Misconduct:

Violations of academic integrity will result in automatic failure of the class and referral to the proper university officials. The work a student submits in a class is expected to be the student's own work and must be work completed for that particular class and assignment. Students wishing to build on an old project or work on a similar topic in two classes must discuss this with the professor. Academic dishonesty includes but is not limited to: cheating on an examination and submitting an assignment as your own work when all or part of the assignment is the work of another without proper citation. Sanctions can be applied whether the violation was intentional or not so please know how to properly cite references for a scientific paper.

For further information regarding UWSP policy please refer to Chapter 14 in the University Handbook (<http://www.uwsp.edu/admin/stuaffairs/rights/rightsChap14.pdf>)

## Late Policy:

All assignments can be turned in late. For each day they are late 1 point will be deducted. Exams can be turned in late as well but for every day the exam is late 10 points will be deducted.

## Grades:

Scale:

A	93-100	C	73-76
A-	90-92	C-	70-72
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
C+	77-79	F	<60

## Assignments:

	<u>Number</u>	<u>Points</u>	<u>Total Points</u>	<u>Percent of Total</u>
Weekly Discussion Questions	13	10	130	28.3%
Weekly Journal Article Summary	13	10	130	28.3%
Exams	2	100	200	43.4%

## Weekly Discussion Questions

Each week you will be given discussion questions that you must respond to in a thoughtful and clear manner. Some weeks these questions will be answered by you alone and you will submit your responses to me on the Canvas page. You will need to rely on your readings and additional research to properly answer the discussion questions. These questions must be submitted by end of the week in a Microsoft Word document on the Canvas page for this class. Be sure you answer each question in a thorough and detailed manner. The best responses to these questions

usually entail citations when needed to justify your response. Other weeks the discussion questions will be opened up as a discussion for the entire class to respond to on the discussion board in Canvas. In this format you must provide your response to the question being posed AND critique other students' response as well. Your grade will be based on both your response to the discussion questions and your effort in responding to other students' responses.

### **Journal Article Summary**

Each week a different journal article has been selected for you to read as supplemental material for the lecture topic. After reading each article you must provide a 500-word summary. Please do not repeat the abstract as I am more interested in the application of the article's findings. In your response I want you to summarize the design and scope of the study, provide a thorough discussion of its findings, and provide your opinions on the article and its application. Please use Microsoft Word for your summaries.

### **Due Dates**

I will do my best to post the weekly materials (lectures, discussion questions, and the journal article) on Monday of each week by 9am. The due date for discussion posts and your journal article summary will be Sunday of that week by 5pm. Exams will have extended deadlines and I usually give students around 2 weeks to submit exams.

### **Exams**

You will be required to complete a mid-term and final exam in this class. I will ask questions that will require to apply the knowledge you have gained through the readings to answer applied questions based on ecosystem topics. You should feel free to use citations to answer questions but be sure you properly cite any material you use in your response. Exams will be assessed in a variety of formats so please look over the questions carefully. If you are unclear on how to respond to a question then please reach out to me. I will be happy to answer any clarifying questions.

## Tentative Schedule

<b>Week</b>	<b>Topic</b>	<b>Reading in Text</b>	<b>Article</b>
1 (Jan 20)	Introduction to Ecosystems	Ch. 1 – The Ecosystem Concept (Chapin et al.)	Nelson et al. 2009
2 (Jan 27)	Stream and Rivers	Ch. 5 – Physiography of Flowing Waters (Dodds)	Junk et al. 1989
3 (Feb 3)	Lakes and Reservoirs	Ch. 6 – Physiograph of Lakes and Reservoirs (Dodds)	Bednarek 2001
4 (Feb 10)	Soils	Ch. 3 – Geology, Soils, and Sediments (Chapin et al.)	Bronick and Lal 2005
5 (Feb 17)	Primary Production	Ch. 5 – Carbon Inputs to Ecosystems (Chapin et al.)	Mulholland et al. 2001
6 (Feb 24)	Decomposition	Ch. 7 – Decomposition and Ecosystem Carbon Budgets (Chapin et al.)	Ashton et al. 2005
7 (Mar 2)	Carbon Cycling	Ch. 6 – The Carbon Cycle (Weathers et al.)	Norby et al. 2010
8 (Mar 9)	Exam 1 (Due Mar 20)		
9 (Mar 16)	SPRING BREAK		
10 (Mar 23)	Nitrogen and Phosphorus	Ch. 9 – Nutrient Cycling (Chapin et al.)	David and Gentry 2000
11 (Mar 30)	Freshwater Ecology	Ch. 10 – Biodiversity in Freshwaters (Dodds)	Lyons et al. 2000
12 (Apr 6)	Eutrophication	Ch. 17 – Trophic State and Eutrophication (Dodds)	Elser et al. 2007
13 (Apr 13)	Species Composition	Ch. 11- Species Effects on Ecosystem Processes (Chapin et al.)	Hecky et al. 2004
14 (Apr 20)	Resilience and Resistance	Ch. 12 – Temporal Dynamics (Chapin et al.)	deYoung et al. 2008
15 (Apr 27)	Management and Restoration	Ch. 15 – Managing and Sustaining Ecosystems (Chapin et al.)	Chapin et al. 2008
16 (May 4-15)	Exam 2 (Due May 15)		