

# **NRES 251: Introduction to Soil and Water Resources**

## **Fall Semester 2022 SYLLABUS**

### **Course Information:**

Lecture Time: Monday/Tuesday/Thursday 2:00 pm – 2:50 pm

Lecture Location: TNR 120

Credits: 4

Lab Times:

Section 2-1 – Tuesday 9:00 am – 10:50 pm (Herrman)

Section 2-2 – Wednesday 12:00 pm – 1:50 pm (Gunderson)

Section 2-3 – Monday 3:00 pm – 4:50 pm (Herrman)

Section 2-4 – Tuesday 3:00 pm – 4:50 pm (Gunderson)

Lab Location: 262 Trainer Natural Resources Building

Prerequisites: MATH 107

### **Instructors 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: Thursday 10:00 am – 11:00 am or by appointment. If needed Zoom appointments can be setup in lieu of meeting in my office. Please send an email if a virtual meeting is needed.

Ms. Alyssa Gunderson

Email: Alyssa.Gunderson@uwsp.edu (*preferred contact method*)

Office: 275 Trainer Natural Resources Building

Office Phone: 715-346-3760

Office Hours: Thursday 1:00 – 2:00 pm or by appointment. If needed Zoom appointments can be setup in lieu of meeting in my office. Please send an email if a virtual meeting is needed.

## Course Objective:

The objective of this class is to expose students to the principles of soils and water resources. This will be accomplished using direct instruction methods during lecture and hands-on experience in the lab and in the field. After completing this course a student will be able to understand how water flows through the landscape, how specific aquatic ecosystems function, and where sources of water contamination are commonly found. Regarding soils, students will also be able to describe the formation and composition of soils. In addition, students will learn how water, organic matter, and elements are processed within soils and why this medium is critical for supporting life on Earth.

## Learning objectives:

- Describe the hydrologic cycle in a watershed including groundwater interactions
- Demonstrate how streams/river, lakes, and wetlands function on the landscape
- Evaluate basic water chemistry data
- Describe the formation of soils
- Determine soil texture and interpret how texture will impact soil function
- Illustrate the connection between the physical properties of soil, soil chemistry, and the availability of macro and micronutrients

## Required text:

Brady, NC and RR Weil. 2010. Elements of the Nature and Property of Soils (3<sup>rd</sup> ed). Prentice Hall. New Jersey.

Pennington, KL and TV Cech. 2010. Introduction to Water Resources and Environmental Issues (1<sup>st</sup> ed). Cambridge University Press. New York.

## 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

## Points:

	<u>Points</u>	<u>Total</u>	<u>Percent of Total Grade</u>
Exams (4)	30	120	50%
Lab Quizzes (2)	20	40	17%
Lab Assignments (8)	10	80	33%

**Exams:**

Four exams will be given in class and consist of multiple choice questions. Exams will cover new material and will not be cumulative although some material in this class will carry over through the entire semester.

**Lab Assignments:**

Lab assignments are found in the lab manual or will be assigned during lab. Be sure the assignments are clearly written and all of your work can be followed. If asked create Excel graphs with all your axes labeled and be sure to include units. If asked for a brief explanation then please print out your assignment using a word processor and check all spelling/grammar.

**Lab Quizzes:**

Two lab quizzes will be given throughout the semester. These quizzes will cover only material introduced in your lab section. They could be short answer or multiple choice and will test you on the concepts you applied in the lab or field during lab time.

**Complications related to COVID:**

As we enter into the semester there are a lot of unknowns related to COVID. There is the chance that at some point this semester you will have to miss class due to the following: positive diagnosis for COVID, quarantine notification from Health and Human Services, or feeling ill and awaiting test results. In each of these cases it is critical you do the following: as soon as possible email your instructors (lab and lecture instructor), indicate in this email why you are missing class, which classes (lab, lecture, etc.) you will not be present for, and the dates of the classes you will be required to miss. After assessing the situation your instructors will inform you the best way to make up any class time that you have missed or if any extensions for assignments, quizzes, or exams. If you do not inform your instructors of the situation in a complete and timely manner it will be impossible for us to help you with the material you have missed.

**Civility in the Classroom:**

To create and preserve a classroom atmosphere that optimizes teaching and learning, all participants share a responsibility in creating a civil and non-disruptive forum. Students are expected to conduct themselves at all times in this classroom in a manner that does not disrupt teaching or learning.

- You are expected to be on time. Class starts promptly at 2:00 pm. You should be in your seat and ready to begin class at this time. Class ends at 2:50 pm. Packing up your things early is disruptive to others around you and to myself.
- Cell phones must be turned off during class, unless you have informed me ahead of time that you are expecting an emergency message.

- Anyone using tablets and laptops to take notes must sit on the sides or back of the lecture hall. These devices can be distracting to people sitting near you. If I find that you are using these devices for non-class room related activities then I will ask you to not use them for the remainder of the semester.
- Classroom participation is an important part of our lectures and is crucial for labs. To participate you must attend class having prepared the materials for the day. Questions and comments must be relevant to the topic at hand.
- Raise your hand to be recognized.
- Classroom discussion should be civilized and respectful to everyone and relevant to the topic we are discussing. Classroom discussion is meant to allow us to hear a variety of viewpoints. This can only happen if we respect each other and our differences.

### **Late Policy:**

Lab assignments are considered late if they are not turned in at the beginning of lab on the due date. Assignments can be turned in late, but 1 point will be taken off for each day the assignment is late. Exams **cannot** be made up unless there is a valid, documented excuse for missing class.

### **Attendance:**

If you are going to miss a lecture or an exam, please contact me as soon as possible. I will provide a make-up exam if the absence is appropriately documented and I am contacted prior to the exam.

### **Inform Your Instructor of Any Accommodations Needed:**

If you have a documented disability and verification from the Disability and Assistive Technology Center and wish to discuss academic accommodations, please contact your instructor as soon as possible. It is the student's responsibility to provide documentation of their disability to Disability Services and meet with a Disability Services counselor to request special accommodation before classes start.

The Disability and Assistive Technology Center is located in 609 Albertson Hall and can be contacted by phone at (715) 346-3365 (Voice) (715) 346-3362 (TDD only) or via email at [datctr@uwsp.edumailto:datctr@uwsp.edu](mailto:datctr@uwsp.edumailto:datctr@uwsp.edu)

### Statement of Policy

UW-Stevens Point will modify academic program requirements as necessary to ensure that they do not discriminate against qualified applicants or students with disabilities. The modifications should not affect the substance of educational programs or compromise academic standards; nor should they intrude upon academic freedom. Examinations or other procedures used for evaluating students' academic achievements

may be adapted. The results of such evaluation must demonstrate the student's achievement in the academic activity, rather than describe his/her disability.

If modifications are required due to a disability, please inform the instructor and contact the Disability and Assistive Technology Center in 609 ALB, or (715) 346-3365.

### **Commitment to Integrity:**

As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this class and also integrity in your behavior in and out of the classroom.

### **UWSP Academic Honesty Policy & Procedures:**

Student Academic Disciplinary Procedures

UWSP 14.01 Statement of principles

The board of regents, administrators, faculty, academic staff and students of the university of Wisconsin system believe that academic honesty and integrity are fundamental to the mission of higher education and of the university of Wisconsin system. The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. Students who violate these standards must be confronted and must accept the consequences of their actions.

UWSP 14.03 Academic misconduct subject to disciplinary action.

(1) Academic misconduct is an act in which a student:

- (a) Seeks to claim credit for the work or efforts of another without authorization or citation;
- (b) Uses unauthorized materials or fabricated data in any academic exercise;
- (c) Forges or falsifies academic documents or records;
- (d) Intentionally impedes or damages the academic work of others;
- (e) Engages in conduct aimed at making false representation of a student's academic performance; or
- (f) Assists other students in any of these acts.

(2) Examples of academic misconduct include, but are not limited to: cheating on an examination; collaborating with others in work to be presented, contrary to the stated rules of the course; submitting a paper or assignment as one's own work when a part or all of the paper or assignment is the work of another; submitting a paper or assignment that contains ideas or research of others without appropriately identifying the sources of those ideas; stealing examinations or course materials; submitting, if contrary to the rules of a course, work previously presented in another course; tampering with the laboratory experiment or computer program of another student; knowingly and intentionally assisting another student in any of the above, including assistance in an arrangement whereby any work, classroom performance, examination or other activity

is submitted or performed by a person other than the student under whose name the work is submitted or performed.

**Unauthorized sharing of course materials:**

Lecture materials, recordings, and lab manuals for this course are protected intellectual property at UW-Stevens Point. Students in this course may use the materials and recordings for their personal use related to participation in this class. Students may also take notes solely for their personal use. If a lecture is not already recorded, you are not authorized to record my lectures without my permission unless you are considered by the university to be a qualified student with a disability requiring accommodation. [Regent Policy Document 4-1] Students may not copy or share lecture materials and recordings outside of class, including posting on internet sites or selling to commercial entities. Students are also prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct.

## Tentative Schedule (could change as semester progresses):

### Lecture Schedule

	Date	Lecture Topic	Reading
1	Sept 6	Introductions and syllabus	
	Sept 8	Hydrologic Cycle	Ch. 3 Pennington and Cech
	Sept 12		
2	Sept 13	Watershed Basics	Ch. 5 Pennington and Cech
	Sept 15		
	Sept 19		
	Sept 20		
3	Sept 22	Water Use	Pgs 17-32, Ch. 11 Pennington and Cech
	Sept 26		
	Sept 27		
	<b>Sept 29</b>	<b>Exam I</b>	
5	Oct 3	Groundwater	Ch. 6 Pennington and Cech
	Oct 4		
6	Oct 6	Water Quality	Ch. 4 Pennington and Cech
	Oct 10		
7	Oct 11	Nitrogen and Phosphorus	Additional readings provided on Canvas page
	Oct 13		
	Oct 17		
8	Oct 18	Streams and Rivers	Ch. 8 Pennington and Cech
9	Oct 20	Lakes	Ch. 7 Pennington and Cech
10	Oct 24	Wetlands	Ch. 9 Pennington and Cech
11	<b>Oct 27</b>	<b>Exam II</b>	
12	Oct 31	Soil Composition	Ch. 1 Brady and Weil
	Nov 1	Soil Formation	Ch. 2 Brady and Weil
13	Nov 3		
14	Nov 7	Soil Classification	Ch. 3 Brady and Weil
	Nov 8	Soil Physical Properties	Ch. 4 Brady and Weil
15	Nov 10	Soil Water	Ch. 5 Brady and Weil
	Nov 14		
16	Nov 15	Organic Matter	Ch. 11 Brady and Weil
	Nov 17		
	Nov 21		
	<b>Nov 22</b>	<b>Exam III</b>	
17	<b>Nov 24</b>	<b>NO CLASS</b>	
	Nov 28	Soil Chemistry – CEC	Ch. 8 Brady and Weil
	Nov 29		
18	Dec 1		
19	Dec 5	Soil pH	Pgs 269-301 Brady and Weil
20	Dec 6	Soil Biology	Ch. 10 Brady and Weil
	Dec 8		
	Dec 12	Soil Conservation – BMP's	Pgs 481-481, 513-516 Brady and Weil
Dec 13			
	Dec 15		
<i>Finals Week</i>			
<b>Dec 16 from 2:45 pm – 4:45 pm: Exam IV</b>			

### Lab Schedule

WEEK # of semester	Week of:	TOPIC
1	9/5	No Lab
2	9/12	Soil horizons, forming factors, and texture p. 3-16
3	9/19	<b>Field trip</b> – Stream flow measurement p. 54-58
4	9/26	<b>Field trip</b> – Wetlands, water quality - Moses Creek p. 68-74
5	10/3	Principles of ground water hydrology p. 84-90
6	10/10	<b>Field trip</b> – Ground water-surface water connection – Little Plover River p. 91-95
7	10/17	Ground water resource evaluation - Little Plover River GIS p. 96-100
8	10/24	<b>Field trip</b> – Water supply and wastewater treatment p. 76-83 <b>Lab quiz</b>
9	10/31	<b>Field trip</b> – Soil profile description writing p. 46-52
10	11/7	<b>Field trip</b> – Water and heat in a soil profile p. 38-41
11	11/14	Watershed analysis – GIS p. 101-112
12	11/21	No Lab- Thanksgiving break
13	11/28	Soil texture, density, porosity, and volumetric moisture content p. 20-36
14	12/5	Soil cation exchange capacity p. 42-45
15	12/12	The soil survey and its interpretation for land use planning p. 123-137 <b>Lab quiz</b>