# ENVR 201: Water Quality & Water Resource Management

Instructor:	Dr. Drew Gower	Term:	Fall Semester 2024
Class Day/Time:	TTh $9:55$ am to $11:10$ am	Class Location:	LSF L $205$
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Office Hours:	WF 11:30am to $1:30$ pm	Office Location:	MSB 301A

## **Course Description**

This course provides students with an overview of water resources management, with a special emphasis on examples drawn from South Carolina and the Pee Dee. Topics will include surface and groundwater resources, demand from the agricultural, energy, domestic, and environmental sectors, and the impact of population growth, climate change, and governmental policies on water quality and availability.

## Learning Objectives

At the end of the semester, students should be able to:

- Understand the hydrological cycle and be able to perform basic mass balance calculations
- Identify the types of water resources and their uses and limitations
- Explain how water demand for different sectors varies over time and by location
- Analyze the impact of population growth, climate change on water quality and availability
- Recognize the different types of water law and how they translate into government policies
- Discuss the primary water resource management problems affecting South Carolina

## **Course Format**

As climate change continues to impact society, it will become increasingly important for informed citizens to understand the principles of water resources management. I hope that after taking this course, you will be familiar with the field's most important concepts and be able to thoughtfully discuss contemporary challenges related to water quality and availability. I therefore prioritize in-class discussion over power-point lectures and will invite guest lecturers to put course topics in a local, South Carolina context. To succeed in the course you will need to both complete the assigned readings and attend class. The former will give you the background necessary to engage in class discussions, while the latter will underscore the specific topics that will appear on the exams. In return, I promise to make myself available to students outside of class, respond to emails and grade items promptly, and to avoid "nitpicky" exam questions.

### Textbook

The textbook for this course is *Water Resources: Science and Society* by George Hornberger and Debra Perrone. You can purchase the book through the University bookstore or online; however, you will need to have access to some version of the textbook to pass the course. I may also assign supplemental readings that will be posted to Blackboard.

## Grading

Your lecture grade is made up of three midterm exams and a final exam (60%), participation (20%), and quizzes (20%). I will then assign letter grades based on the following ranges:

<sup>&</sup>lt;sup>1</sup>Please use sparingly

Letter Grade	Percentage Range
А	90 to $100%$
$B^+$	87 to $89%$
В	80 to $86%$
$C^+$	77 to $79%$
$\mathbf{C}$	70 to $76\%$
$\mathrm{D}^+$	67 to $69%$
D	60 to $66%$
F	below $60\%$

### Exams

Exams will include multiple choice, true/false, and free response questions. The three midterm exams will cover material since the previous exam, while the final exam will cover material from the entire course. Exams will be given during regular class time and must be taken on the assigned day, with exceptions made only with proper documentation. I will drop your lowest exam grade, either one of the midterms or the final.

## Participation

I will take attendance at the beginning of each class and note down your participation in class discussion and activities. After your fifth unexcused absence, I reserve the right to dismiss you from the course and assign you a failing grade. I also require that all students come to my office hours at least once during the semester. Your participation grade will be a combination of the above elements.

## Quizzes

At the beginning of classes for which readings are assigned, I will give short (two or three questions) quizzes that are based on those readings. You will not have the opportunity to make up a quiz if you miss it; however. I will drop that quiz grade if you provide valid documentation for why you were not present.

### Extra Credit

Our local, state, and federal governments play an important role in managing our water resources. As an incentive for you to engage with the political process, I will give you an extra two percentage points on your final grade if you show me that you are registered to vote. Alternatively, you may turn in, up to the last day of class, one two-page, single-spaced summary and evaluation of a scientific article to receive up to the same amount of extra credit. The article should be published in a peer-reviewed journal, relevant to water resources management, and approved by me ahead of time. Lastly, I will award you an extra five percentage points on one exam if you can point out a previously-unnoticed typo on this syllabus.

### **Electronic Devices**

I do not allow cell phone use during class time. If you need to have your phone on for some reason (say you are responsible for a family member), please set it to vibrate and take any relevant calls outside the classroom. You may use a laptop or tablet for notetaking but you will need a pen or pencil to take exams.

### Accommodations

I am happy to make accommodations for students with special needs. Please notify me of your needs as soon as possible and provide documentation from the Office of Counseling and Testing.

### Academic Dishonesty

I take acts of academic dishonesty very seriously. For the first violation of the University academic integrity policy you will receive a grade of 0 on the assignment in question and be reported to the appropriate University office. A second violation may result in suspension from the University for a term of no less than one fall or spring semester while a third offense may result in permanent expulsion from the University.

# Tentative Course $Outline^2$

Date	Topics	Readings
08/20	Course Introduction	
08/22	The Hydrological Cycle	W.R.S.S. Ch. 1
08/27	The Hydrological Cycle	South Carolina Hydrology
08/29	Surface Water Resources	W.R.S.S. Ch. 2
09/03	Streamflow Measurement	Video: Streamflow Measurement
09/05	Groundwater Resources	W.R.S.S. Ch. 3
09/10	Well construction	Video: Monitoring Well Installation
09/12	Well Installation	
09/17	Soil Water Resources	W.R.S.S. Ch. 4
09/19	Soil Water Resources	Soil Testing
09/24	Exam 1	
09/26	Agricultural Water Use	W.R.S.S. Ch. 5
10/01	Agricultural Water Use	Irrigation Tool
10/03	Energy Water Use	W.R.S.S. Ch. 6
10/08	Field Trip to Nuclear Power Plant $(10/05)$	
10/10	Environmental Water Use	W.R.S.S. Ch. 8
10/15	Guest Lecture: Carolina Bays	
10/17	Domestic Water Use	W.R.S.S. Ch. 7
10/22	Field Trip to Wastewater Treatment Plant	
10/24	Exam 2	
10/29	Population	W.R.S.S. Ch. 9
10/31	Climate Change	W.R.S.S. Ch. 10
11/05	No class: Fall Break	
11/07	Climate Change	
11/12	Water Law	W.R.S.S. Ch. 11
11/14	Water Quality	W.R.S.S. Ch. 12
11/19	Water Management	W.R.S.S. Ch. 13
11/21	Guest Lecture: Regional Water Planning	
11/26	Exam 3	
11/28	No class: Thanksgiving Break	
12/05	Final Exam, 3:00pm	

 $<sup>^{2}</sup>$ Will likely change over the course of the semester; I will keep you updated as to alterations