



**ENR 3280**  
**Water Quality Management**  
**Autumn Semester 2023**

**Class Time/Location:** Monday/Wednesday 4:10 – 5:05 pm, Journalism bldg 300

**Instructor:** Dr. Rachel Gabor  
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473b Kottman Hall

**TA:** Scott Hickman  
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**Course Description:**

In this course we will explore the physical, chemical, and biological aspects of water quality. We will study how natural watershed processes drive the functioning of lakes and rivers and how anthropogenic processes alter water quality. We will then explore critical water quality issues in North America and the world, their impacts on human health, and ways they are managed.

Topics we will cover include:

- Physical/chemical properties of water and the hydrologic cycle
- Physical structure of watersheds, lakes, and rivers
- Nutrient cycling
- Metals and dissolved solids
- Acids and bases
- Water quality impacts on algae, insects, and fish
- Invasive species
- Case studies (including: harmful algal blooms, mining, plastics)

## Texts

This book is **required**. We will be reading it later in the semester. Feel free to start reading sooner if you would like more time to read it:

Dan Egan. (2017) *The Death and Life of the Great Lakes*. W.W. Norton & company.

Other readings, including articles and chapters from textbooks available as eBooks through OSU will be assigned on Carmen throughout the semester. The following are at the OSU libraries for **reference** and no purchase is needed:

Boyd, Claude E. 2015. *Water Quality: An introduction*, 2nd edition. Springer Science and Business Media, LLC (eBook through OSU Library)

Allan, David J. and Castillo, Maria M. 2007. *Stream Ecology: Structure and Function of Running Waters*. Springer. (eBook through OSU Library)

Pennington, Karrie Lynn and Thomas Cech 2010. *Introduction to Water Resources and Environmental Issues*. Cambridge University Press.

## Carmen / Course Communication

Course announcements will be made through the Announcement feature on Carmen. I highly recommend you adjust your Carmen settings so announcements are emailed to you.

The Carmen calendar and modules will be updated regularly with topics covered, homework, and readings.

The best way to communicate with the instructor and TA is through email (or messages on Carmen). We will endeavor to respond to communications within 24 hours but note that we may not check outside of business hours (M – F 9-5).

## Office Hours

Both the instructor and TA have office hours scheduled each week – posted to Carmen. Office hours are a time we set aside for you and we welcome you to join them. Office hours can be used for questions about the course but also more general questions you might have about being a student, the field of water science, career ideas, etc. We hope to see most of you at least once over the semester.

If you need to meet on Zoom or want to talk but can't make posted office hours, please don't hesitate to reach out.

## Course Evaluation

Your course evaluation will consist of the following possible exams and assignments:

Evaluation	Points per Assignment	# / semester	Total Possible Points	Approximate percent of total
Homework	20	11	220	33
Weekly Carmen Quiz	5	14	70	11
In Class Activities	5	14	70	11
Exam #1	100	1	100	15
Exam #2	100	1	100	15
Exam #3	100	1	100	15
Total Points over Semester	660			

There are 660 possible total points available over the semester. Final course grades will be assessed from a total of 650 points to allow for some leeway on missed classes/quizzes/assignments. Final grades will be calculated as follows:

Grade	Point Range		Grade	Point Range
A	≥ 605		C+	501-519
A-	585-604		C	475-500
B+	566-584		C-	455-474
B	540-565		D+	436-454
B-	520-539		D	390-435
			F	< 390

\*Note: this grading structure means the Carmen gradebook will not calculate your final grade correctly. Pay attention to your total number of points as you earn them through the semester (which you can see on Carmen).

## How Does Class Work?

This course meets in room 300 in the Journalism Building on Monday and Wednesday 4:10 - 5:05pm. Class time will consist of lectures interspersed with activities and class discussion. There will be readings assigned outside of class and sometimes videos.

Powerpoint slides will be posted before each class session, but are not meant as a replacement for notes. Classes will be recorded on Zoom and posted to Carmen for reference but this is not meant to replace class attendance.

Per OSU policy, you should expect ~4 hours of work outside of class each week to earn a "C"

## Course Assessment

I use multiple forms of assessment in this class. This is to provide many ways to aide your learning and assessment of the material and to allow for different strengths in learning styles. Descriptions of each assessment are below:

**Homework Assignments:** There will be 11 homework assignments given throughout the semester. Each assignment will be worth 20 points. Homework is due at the beginning of class on Wednesdays (unless otherwise noted). Homework should be submitted to Carmen in pdf format. If you choose to handwrite your homework (recommended for equations/diagrams) and don't have a tablet, there are great free apps (AdobeScane, iPhone's Notes app) which have built-in scanners. Note that it is your responsibility to ensure you upload the correct assignment and that it is easy to read.

**Weekly Carmen Quizzes:** Online quizzes will be posted on Carmen most weeks. These are designed to help you review that week's material and identify if there is anything you don't understand that you need to reinforce with a reading or office hours. This will occur 14 times during the semester and are worth 5 points. You may use your notes for these but please take them independently. You will have 2 attempts for each quiz and the highest score will be kept. Quizzes will be posted by 9am on Thursday and due by midnight on Sunday.

**In-Class Work:** In-class activities will periodically be collected to assess participation. Each activity is worth 5 points and this will happen 14 times over the semester. In most cases, being present and participating will gain you full points. I will always announce in class on the days that points are being assessed and it is your responsibility to ensure we record your participation.

**Exams:** There will be 3 exams, focused on each of the three units in the class (physical, chemical, biological). All material covered to that point will be considered relevant for each exam. This is because each week of the course builds upon the previous material. The exams will be in person. You will be able to bring one 8.5"x11" sheet of paper with handwritten notes to each exam. There is no final exam.

This is a **DRAFT CALENDAR** of the semester. Everything, including exam dates, is subject to change. Check Carmen regularly for updates.

Week	Monday	Wednesday	HMWK Wed	Quiz
<b>1</b>		<i>August 23</i> Course Overview		<b>X</b>
<b>2</b>	<i>August 28</i> Global Water Cycle, Residence Time, Watersheds	<i>August 30</i> River Morphology Streamflow	<b>X</b>	<b>X</b>
<b>3</b>	No class – Labor Day	<i>September 6</i> Lakes Mixing	<b>X</b>	<b>X</b>
<b>4</b>	<i>September 11</i> Mass Balance in Hydrology	<i>September 13</i> Hydrographs Flow Regimes	<b>X</b>	<b>X</b>
<b>5</b>	<i>September 18</i> Hydrologic Measurements	<i>September 20</i> Loads and Mass Balance	<b>X</b>	<b>X</b>
<b>6</b>	<i>September 25</i> Turbidity Total Dissolved Solids	<i>September 27</i> EXAM #1: Physical Aspects of Water Quality		<b>X</b>
<b>7</b>	<i>October 2</i> Acid and Bases	<i>October 4</i> Metals Acid Mine Drainage	<b>X</b>	<b>X</b>
<b>8</b>	<i>October 9</i> Nutrients	<i>October 11</i> Nitrogen	<b>X</b>	<b>X</b>

Week	Monday	Wednesday	HMWK Wed?	Quiz Fri?
9	<b>October 16</b> Phosphorus Carbon	<b>October 18</b> Eutrophication	<b>X</b>	<b>X</b>
10	<b>October 23</b> Nutrient/Runoff Management	<b>October 25</b> Algae	<b>X</b>	<b>X</b>
11	<b>October 30</b> EXAM #2: Chemical Aspects of Water Quality	<b>November 1</b> Macroinvertebrates		<b>X</b>
12	<b>November 6</b> Fish	<b>November 8</b> Invasive Species Contaminants	<b>X</b>	<b>X</b>
13	<b>November 13</b> Climate Change and Water	<b>November 15</b> Climate Change and Water	<b>X</b>	<b>X</b>
14	<b>November 20</b> Water Treatment Infrastructure	Thanksgiving Break – No Classes		
15	<b>November 27</b> Emerging Contaminants	<b>November 29</b> Clean Water Act	<b>X</b>	<b>X</b>
16	<b>December 4</b> Jobs/Research in Water Quality	<b>December 6</b> EXAM #3: Biological Aspects of Water Quality and Current Issues		

## **Class Policies**

### **Please Ask for Help**

The students in this course come from a wide range of backgrounds and majors, so there may be times you find an aspect of this course particularly challenging. I invite you to come to office hours for help. The sooner you bring forth your concerns, the sooner I can help – there is very little that can be done at the end of the semester.

You are encouraged to work with other classmates on assignments. However you should do the write-ups entirely on your own, in your own words, to ensure you fully understand the solution.

### **Note About Assignment Deadlines (aka: shit happens)**

Life happens. College is a stressful time and the world is a chaotic place. If something is happening in your life that will impact your full participation in the course, please utilize campus resources and give me a heads up so we can work together to find a way to best help you succeed. Every student in this class can, once during the semester, get an automatic 2 day extension on a homework assignment for any reason. To utilize this please email the TA before the due date to let them know you plan to use your extension and arrange how to submit the assignment. If you need flexibility with a deadline beyond this, please ask before the due date so I have more options to help you.

Note: There will generally be no extensions/make-ups for the weekly Carmen Quizzes or class participation as my grading policy allows you to miss 10 points without penalty.

### **Classroom Behavior**

Please respect me and your fellow students and refrain from distracting behavior in class including private discussions, sleeping, phone usage, etc. If you have a laptop out to take notes please avoid watching videos or going to a website that might distract those around you (trust me, if you are watching TikTok, everyone around you is watching with you). If you are expecting a phone call, please sit at an aisle so you can discretely step out.

### **Accommodations and Learning Environment**

I am committed to our class being a learning environment where students can feel safe and can reach their full potential. Please respect other student's identities, backgrounds, and experiences. If you need an accommodation please let me know so we can discuss best ways to meet your needs for the course and please utilize student life and disability services. Additionally, if you are a parent and/or need accommodations due to caregiving responsibilities, please let me know.

## **Student Resources**

There are many resources on campus devoted to assisting students personally and academically. Please do not hesitate to utilize them if you find you need. Some include:

Counseling and Consultation Service: <https://ccs.osu.edu/>

Ohio State Writing Center: <https://cstw.osu.edu/writing-center>

Dennis Learning Center: <http://dennislearningcenter.osu.edu/>

Office of Diversity and Inclusion: <https://odi.osu.edu/>

OSU Libraries: <https://library.osu.edu/>

Math and Statistics Learning Center: <https://mslc.osu.edu/>

## **Ohio State's academic integrity policy**

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>. If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct.

### **Statement on Title IX**

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at [titleix@osu.edu](mailto:titleix@osu.edu)



## **Accessibility accommodations for students with disabilities**

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

If you are isolating while waiting for a COVID-19 test result, please let me know immediately. Those testing positive for COVID-19 should refer to the [Safe and Healthy Buckeyes site](#) for resources. Beyond five days of the required COVID-19 isolation period, I may rely on Student Life Disability Services to establish further reasonable accommodations. You can connect with them at [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; or [slds.osu.edu](http://slds.osu.edu).

## **Commitment to Diversity, Equity, & Inclusion**

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Class rosters are provided to the instruction with the student's legal name. I will gladly honor your request to address you by the name and pronoun you wish to use in this class. Please advise me if this is different from the roster early in the semester so I may make appropriate changes to my records.