CSUS 354
Water Resources Management

Spring 2022
Tuesday and Thursday, 2:40 – 4:00 p.m.
G 11 Holden Hall

INSTRUCTOR

Ruth Kline-Robach
Water Resources Specialist
Department of Community Sustainability
Institute of Water Research
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OFFICE HOURS

I am happy to meet with you to answer your questions about the course materials or to discuss your career goals. I will be available after class on Tuesday and Thursday, or you may send me an email message to schedule an alternative time to meet.

COURSE DESCRIPTION

CSUS 354 introduces the biophysical, community and institutional components of comprehensive water resources management. The course emphasizes processes, both biophysical and social, that control the quality and quantity of aquatic resources at the watershed level.

COURSE LEARNING OUTCOMES

Students who complete this course will:

1. Describe components of the hydrologic cycle, and explain the cause and effect relationship between human activities and water quality/quantity problems;
2. Analyze water management issues at the local, regional and national levels, and recognize the complexity resulting from multiple viewpoints of the issues;
3. Explain issues and concepts related to water policy, management and planning;
4. Access and interpret water resources information and apply it to decision-making processes.
5. Summarize and synthesize research publications.

These course outcomes support the Department of Community Sustainability undergraduate program competencies of critical thinking, systems thinking, ecological literacy, boundary crossing and initiative and practical skills. Successful completion of this course provides students with the background needed to analyze water resources issues within community-based and watershed frameworks.

REQUIRED TEXT

Cech, Thomas V., 2018, **Principles of Water Resources History, Development, Management, and Policy**, 4th Edition, John Wiley & Sons.

Links to additional required readings will be posted on the course Desire to Learn (D2L) site (https://d2l.msu.edu).

COURSE FORMAT

The course subject matter is a mixture of quantitative theories describing the behavior of water and qualitative evaluation of the human dimensions of water resources management. Class sessions will include lectures, in-class exercises and student discussions/presentations. This course introduces the watershed approach, which is a framework for coordinating the various disciplines that deal with the science and management of water resources. The watershed approach requires teamwork to reach solutions to water resources problems; therefore, group discussions and work are a substantial component of this course.

The material in this course is introductory; however, I do assume that students will learn to read and digest technical literature in addition to the required text. If you are having trouble with the readings, you're probably not alone, so talk to your classmates or set up an appointment to meet with me. You may also e-mail your questions to me and I will address them in class.

GRADING POLICY

Grades will be based on periodic Engagement Check-Ins, two exams, two homework assignments and class engagement/participation. Points will be assigned as follows:

Assignments	**Points**	
6 Engagement Check-Ins	120	**(24%)**
Midterm Exam	125	**(25%)**
2 Homework Assignments	100	**(20%)**
Final Exam	125	**(25%)**
Engagement and Participation	30	**(6%)**
Total Points	**500**	

Grading Scale

Points	**> 470**	**434-470**	**400-433**	**374-399**	**350-373**	**320-349**	**300-319**	**< 300**
Grade	4.0	3.50	3.00	2.50	2.00	1.50	1.00	0

Engagement Check-Ins (20 points each)

Over the semester, you will submit 6 Engagement Check-Ins, worth 20 points each. You will answer a set of questions that are drawn directly from lectures and in-class exercises. ***Each submittal is due by 11:59 pm on Sunday (e.g. Check-In One is due Jan. 16th at 11:59 pm).*** These must be completed individually and answered in your own words.

Midterm and Final Exams (125 points each)

Exams will be completed in class on March 3 and May 5. Alternative dates or makeup exams will be granted only if you discuss your situation with me prior to the exam date.

Homework Assignments (50 points each)

Two homework exercises will be assigned during the semester that are a direct extension of the material covered in class. Students should be prepared to discuss the assignments with the class. More detailed instructions will be provided with each assignment.

Engagement and Participation (30 total points)

You are expected to attend class regularly, arrive on time and participate in class discussions. Engagement/participation grades will be based on your contribution to in-class discussions and small group activities. Please email me in advance if you cannot attend class. This will assist me in preparing for in-class group activities. We will have in-class exercises that will require you to access the Internet, so please bring a device (laptop, browser) to class with you. If you do miss class, lecture notes are provided on the course website. It is your responsibility to review those and/or speak with a classmate about the material you missed.

ASSIGNMENT SUBMISSION AND LATE WORK POLICY

Assignments will be uploaded to the D2L Dropbox – DO NOT email them to me. Although I typically do not accept late homework assignments, due to the ongoing pandemic, I am building flexibility into my attendance and grading policies. Homework assignments submitted after the deadline will be docked by 20% of the maximum grade. Assignments that are submitted more than five days late will not be accepted. I will not be taking daily attendance; rather, throughout the semester, we will complete in-class activities that will contribute to your engagement and participation grade.

If special arrangements are needed you are responsible for contacting me prior to the assignment due date. If you are not able to attend class or meet a deadline due to an illness or other circumstances, please let me know as soon as possible so that we can discuss a revised deadline and/or develop a plan to support your learning and participation.
Grades for written assignments will include evaluation of spelling, grammar, and syntax (clarity, flow, sentence structure) in addition to content. Please proofread all work and be professional with all submittals.

ZOOM ETIQUETTE

We will begin this semester as a synchronous online class, meaning that we will meet at a specific time (Tu-Th at 2:40 pm) through Zoom. You are expected to attend class regularly, access the Zoom link on time and participate in class discussions, breakout room work and polls. Do your best to find a quiet location that is free from distractions, so you can fully engage with your instructor and peers, and please be considerate and appropriate while class is in session.

If you have connectivity issues, you may phone into the Zoom session by dialing +1 301 715-8592.
Meeting ID: 946 8238 3450 **Passcode:** CSUS

FACE COVERINGS AND CLASSROOM ETIQUETTE

Once we are able, we will meet face-to-face in the classroom. A face covering must be worn over your nose and mouth while in class. Those students not wearing an acceptable face covering and who do not have an approved accommodation will be asked to leave class. ***This is a non-negotiable.***

Please refrain from texting, checking social media sites, surfing the web, or engaging in any other activities that are not directly related to the course during class time. Those behaviors are disrespectful and more disruptive than you may realize. Be considerate.

INCLUSIVITY

As members of the MSU community and this class, it is expected that an effort be made to create an inclusive learning environment in which individuals are expected to treat each other with respect, civility, and consideration. With a variety of educational and cultural backgrounds and diverse beliefs, it is expected that each of us participate in creating a collaborative environment that embraces different beliefs, ideas, and practices.

We are heading into this semester under stressful circumstances. Please focus on taking care of yourself and extending kindness and grace to those around you.

STUDENTS WITH SPECIAL NEEDS

If you require additional accommodations, please contact me as early as possible in the semester and at least two weeks prior to an exam. The Resource Center for Persons with Disabilities (http://www.rcpd.msu.edu), 884-7273 (voice) or 355-1293 (TTY)) is also available to assist you.

ACADEMIC INTEGRITY

Article 2.III.B.2 of the Academic Freedom Report states: "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, the Department of Community Sustainability adheres to the policies on academic honesty specified in General Student Regulation 1.0, *Protection of Scholarship and Grades*; the all-University Policy on *Integrity of Scholarship and Grades*; *and* *Ordinance 17.00,* Examinations.

Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework, exams, and papers, without assistance from any other person. You are also expected to develop original work for this course; therefore, you may not submit course work you completed for

another course to satisfy the requirements for this course. Also, you are not authorized to use the www.allmsu.com website to complete any course work in this course. Students who violate MSU regulations on Protection of Scholarship and Grades will receive a failing grade in the course or on the assignment.

Instances of plagiarism constitute academic dishonesty and will result in a grade of zero for the assignment in which plagiarism occurs. See https://ombud.msu.edu/resources-self-help/academic-integrity for a definition and discussion of plagiarism. **Turnitin.com will be used for all written assignments.**

Faculty members are required to report all instances in which a penalty grade is given for academic dishonesty. Students reported for academic dishonesty are required to take an online course about the integrity of scholarship and grades. A hold will be placed on the student's account until such time as the student completes the course. This course is overseen by the Associate Provost for Undergraduate Education.

Please also be aware of the Spartan Code of Honor:

"As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do."

CITATIONS AND REFERENCES

The APA format should be used for any in-text citations and reference lists when you rely on information from other sources for the final paper. A good reference site for APA style can be found at https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_style_introduction.html

COMMUNICATIONS

Class materials, including lecture notes, links to required readings and any announcements or changes to the course schedule will be posted on the course D2L website. **Be sure to check the site prior to each class session.**

If you need to contact me for any reason, please e-mail me at kliner@msu.edu.

CSUS 354 SPRING 2022 COURSE SCHEDULE

(*This schedule is tentative and subject to change)*

Date	***Topic and Readings***	***Assignments/ Due Dates***
Week 1		
January 11	**Topic:** Course Introduction and Overview **Reading:** Syllabus and Schedule	
January 13	**Topic:** Introduction to Water Resources **Read prior to class:** • Cech, Ch 1 and 2, pp 133-137 • Gleick, P. and C. Iceland. 2018. *Water, Security and Conflict.*	**Check-In #1 due Jan. 16 at 11:59pm**
Week 2		
January 18	**Topic:** Groundwater **Read prior to class:** • Cech, Ch 4	
January 20	**Topic:** Overview of the Safe Drinking Water Act and Groundwater Management Programs **Read prior to class:** • U.S. EPA. 2004. Understanding the Safe Drinking Water Act • Overview of Michigan's Wellhead Protection Program • Michigan's Source Water Assessment Program In-class exercise: Using Michigan's Groundwater Data	**Homework #1 Assigned**
Week 3		
January 25	**Topic:** Bottled Water **Read prior to class:** • *Overview of FDA Bottled Water Regulations* (website) • *MDARD and DEQ Bottled Water Regulation. OAG Performance Audit Report. 2017.*	

Date	*Topic and Readings*	*Assignments/ Due Dates*
January 27	**Topic:** Overview of the Clean Water Act **Read prior to class:** • Copeland, C. 2010. *Clean Water Act: A Summary of the Law* In-class exercise: Clean Water Act Case Studies	**Check-In #2 due Jan. 30 at 11:59 pm**
Week 4		
February 1	**Topic:** Runoff, Erosion, Stream Flow **Read prior to class:** • Cech, Chapter 3 • UNEP GEAS. 2014. *The future of the Aral Sea lies in transboundary cooperation*	
February 3	**Topic:** Wetlands **Read prior to class:** • Cech, pp 379-383 • Wetlands Case Study Background In-class exercise: Wetlands mitigation deliberation	**Homework #1 due Feb. 6 at 11:59 pm**
Week 5		
February 8	**Topic:** Wetlands (Cont.) and Water Quality Monitoring **Read prior to class:** • Cech, Ch 5 • Copeland, C. 2012. Clean Water Act and Pollutant Total Maximum Daily Loads (TMDLs)	
February 10	**Topic:** Water Quality Monitoring *(continued)* In-class exercise: EGLE 303D Report Review	**Check-In #3 due Feb. 13 at 11:59 pm**

Date	*Topic and Readings*	*Assignments/ Due Dates*
Week 6		
February 15	**Topic:** Current Issue: PFAS (Guest Lecture from Dr. Lois Wolfson) **Read prior to class:** • PFAS Chemicals: A Concern to Human Health and the Environment. The Michigan Riparian. 2020.	
February 17	**Topic:** Lake Processes and Lake Management **Read prior to class:** *Moore, M.L. 1989. NALMS. Water on the Web.* Understanding*:* Lake Ecology Primer (skim this document)	
Week 7		
February 22	**Topic:** *Cadillac Desert* (documentary) **Read prior to class:** • Cech, Ch 9	
February 24	**Topic:** Current Issue: Drought in the Western United States **Read prior to class:** • Drought in the United States: Science, Policy, and Selected Federal Authorities. Congressional Research Service. 2021.	**Check-In #4 due Feb. 27 at 11:59 pm**
Week 8		
March 1	**Topic:** TBA	
March 3	**Midterm Exam**	
Week 9		
March 8 & 10	**Spring Break – No Classes**	

Date	*Topic and Readings*	*Assignments/ Due Dates*
Week 10		
March 15	**Topic:** Residential Water Resources Management and Onsite Wastewater Treatment Systems **Read prior to class:** • Loudon. Septic System FAQs • EGLE *Water Well Drilling Methods*	
March 17	**Topic:** Residential Water Resources Management and Onsite Wastewater Treatment Systems, Cont.	
Week 11		
March 22	**Topic:** Municipal Wastewater and Drinking Water Treatment Processes **Read prior to class:** • Cech, Ch. 11 • WEF. *Following the Flow: An Inside Look at Wastewater Treatment* • National Small Flows Clearinghouse. *Lagoon Systems*	**Homework #2 Assigned**
March 24	**Topic:** Agricultural Water Management **Read prior to class:** • Cech, pp. 186-199 • Michigan's Right to Farm Program and GAAMPs	**Check-In #5 due March 27 at 11:59 pm**
Week 12		
March 29	**No Class - Work on Homework #2**	
March 31	**Topic:** Stormwater Management **Read prior to class:** • Skim the *msu-water.msu.edu* and *mywatersheds.org* stormwater information websites	

Date	*Topic and Readings*	*Assignments/ Due Dates*
Week 13		
April 5	**Topic:** Tollgate Wetlands Tour/MSU Stormwater Walking Tour **Read prior to class:** TBA *Note: On Tuesday half the class will participate in an instructor-led tour of the Tollgate Wetlands while the other half completes a self-guided tour of campus stormwater management sites. We will switch on Thursday.*	
April 7	**Topic:** Tollgate Wetlands Tour/MSU Stormwater Walking Tour, Cont.	**Check-In #6 due April 10 at 11:59 pm**
Week 14		
April 12	**Topic:** Watershed Management Planning **Read prior to class:** • *Developing a Watershed Management Plan for Water Quality: An Introductory Guide* (skim this document)	
April 14	**Topic:** Watershed Management Planning, cont. In-class exercise: Evaluating Watershed Management Plans	**Homework #2 due April 17 at 11:59 pm**
Week 15		
April 19	**Topic:** Water and Conflict (Nestle Controversy) **Read prior to class:** • Cech, Ch 8 and 13 • Shulte. 2012. *The Great Lakes Water Agreements.* In: World's Water Volume 7.	
April 21	**Topic:** *Rivers End* (documentary) **Read prior to class:** • Cech, Ch 14	

Date	*Topic and Readings*	*Assignments/ Due Dates*
Week 16		
April 26	**Topic:** Class Review of Homework #2 submissions	
April 28	Wrap Up, Review **Readings:** • Cech, Ch 15	
FINAL EXAM: Thursday, May 5, 3:00-5:00 pm		