

CSUS 354
Water Resources Management

Spring 2018
Tuesday and Thursday, 2:40 – 4:00 p.m.
19 Natural Resources Building

INSTRUCTOR

Ruth Kline-Robach
Water Resources Specialist
Department of Community Sustainability *and*
Institute of Water Research
310 C Natural Resources Building
353-2880
kliner@msu.edu

OFFICE HOURS

Mondays, 9:30-11:00 am, or by appointment

COURSE DESCRIPTION

CSUS 354 provides an introduction to 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. Gain an understanding of the cause and effect relationship between human activities and water quality/quantity problems;
2. Gain an understanding of water management issues at the local, regional and national levels, including the complexity resulting from multiple viewpoints of the issues;
3. Engage in critical thinking about issues and concepts related to water policy, management and planning;
4. Understand how natural resources information is collected and how it can best be used to facilitate decision-making;
5. Learn to read 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. Students can learn more about the Department of Community Sustainability undergraduate program competencies at http://www.csus.msu.edu/undergraduate/sustainability_core.

REQUIRED TEXT

- Cech, Thomas V., 2010, **Principles of Water Resources History, Development, Management, and Policy**, 3rd Edition, John Wiley & Sons.

Additional required readings will be posted on MSU's 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 and student discussions/presentations. Guest lecturers will discuss water resources issues from various perspectives. Field trips will showcase important water resources treatment processes. We will occasionally access web-based information and data resources in class. Please bring a device for accessing the Internet to class with you.

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. Or, you may e-mail your questions to me and I will address them in class.

GRADING POLICY

Grades will be based on two homework assignments, a group project, two exams, and attendance/participation. Exams are cumulative, but the emphasis will be on material covered since the last exam.

Homework Exercise #1	10%
Midterm Exam	25%
Homework Exercise #2	10%
Group Project	20%
Final Exam	25%
Attendance and Participation	10%

Final course grades will be determined by the following scale:

>90%	4.0
85-89%	3.5
80-84%	3.0
75-79%	2.5
70-74%	2.0
65-69%	1.5
60-64%	1.0
<60%	0.0

Midterm and Final Exams

Exams will be completed in class on March 1st and May 3rd. Makeup exams will be granted only under extreme circumstances, and *only* if you discuss your situation with me *prior to* the exam date.

Homework Assignments

Two exercises will be assigned during the semester. Students will tackle problems that are a direct extension of the material covered in class, and will have approximately two weeks to craft a response. Students should be prepared to discuss the assignments with the class. More detailed instructions will be provided with each assignment.

Late assignments will not be graded. Assignments will be uploaded to the D2L Dropbox. **The site will not accept assignments after the scheduled deadline.** If special arrangements are needed, you are responsible for contacting me *prior to the assignment due date*. Grades for written assignments and the class project will include evaluation of spelling, grammar, and syntax (clarity, flow, sentence structure) in addition to content.

Group Project

Students, working in groups of three, will be required to examine a water resources issue in-depth and provide a written and oral interpretative review of the topic. The goal of this assignment is to examine how natural resources management requires more than just an understanding of the science of the resource. Managing water resources issues usually involves politics, economics, public health, and more intangible factors such as aesthetics, historical importance, tradition, and community pride. A list of possible projects will be provided, but groups may choose an alternative research topic – newspapers and websites are great sources of current water resources issues. Your topic must be approved - I will review your project outline and let you know if your topic is appropriate. The product of this assignment will be:

- A project paper that includes a summary of the background information, an analysis of all sides of the issue and recommendations for resolving the problem or issue;
- A complete list of citations that includes personal interviewees;
- Two questions based on the presentation for possible inclusion in the final exam.
- A presentation to the class with the use of appropriate audio visual aids

You will be graded on your understanding of the issue, as reflected by your background information, the depth of interview(s) with experts/stakeholders, and your analysis of the issue.

Attendance and Participation

Attendance and participation at each class session, and submission of homework assignments by their due dates is expected. *Students are expected to read the assigned materials in advance so that in-class discussions can be a collaborative effort.*

In-class participation grades will be based upon your consistency of attendance and contribution to in-class discussion and small group activities. Please email me in advance if you cannot attend a particular 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.

CLASSROOM ETIQUETTE

You are expected to attend class regularly, arrive on time and participate in discussions. Attendance will be taken each class period. **Please refrain from texting, checking e-mail, 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.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at rcpd.msu.edu. Once your eligibility for an accommodation has been determined, you will be issued a Verified Individual Services Accommodation ("VISA") form. Please present this form to an instructor during the second week of class and/or two weeks prior to the accommodation date (test, project, etc.). Requests received after this date may not be honored.

EMERGENCY SITUATIONS

In the event of an emergency arising within the classroom, the instructor will notify you of what actions may be required to ensure your safety. It is the responsibility of each student to understand the evacuation, "shelter-in-place," and "secure-in-place" guidelines posted in each facility and to act in a safe manner. You are allowed to maintain cellular devices in a silent mode during this course, in order to receive emergency SMS text, phone or email messages distributed by the university. When anyone receives such a notification or observes an emergency situation, they should immediately bring it to the attention of the instructor in a way that causes the least disruption. If an evacuation is ordered, please ensure that you do it in a safe manner and facilitate those around you that may not otherwise be able to safely leave. When these orders are given, you do have the right as a member of this community to follow that order. Also, if a shelter-in-place or secure-in-place is ordered, please seek areas of refuge that are safe depending on the emergency encountered and provide assistance if it is advisable to do so.

GRIEF ABSENCE POLICY

Michigan State University is committed to ensuring that the bereavement process of a student who loses a family member during a semester does not put the student at an academic disadvantage in their classes. If you require a grief absence, you should complete the “Grief Absence Request” web form (found at <https://stuinfo.msu.edu/> under ‘Academics - Enrollment Information and Services - Grief Absence Request Form.’) no later than one week after knowledge of the circumstance. I will work with you to make appropriate accommodations so that you are not penalized due to a verified grief absence.

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 projects, without assistance from any source. 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://www.msu.edu/unit/ombud/academic-integrity/plagiarism-policy.html> 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.”

For more information, visit honorcode.msu.edu.

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 writing homework assignments and the group project. A good reference site for APA style can be found at <https://owl.english.purdue.edu/owl/resource/560/01/>.

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 2018 COURSE SCHEDULE

(This schedule is tentative and subject to change)

<i>Date</i>	<i>Topic and Readings</i>	<i>Assignments/ Due Dates</i>
Week 1		
January 9	Topic: Course Introduction and Overview Reading: Syllabus and Schedule	
January 11	Topic: Introduction to Water Resources Readings: <ul style="list-style-type: none"> • Cech, Ch 1 and 2, pp 139-143 • Montgomery, W., 2014. <i>Navigating Troubled Waters: A Primer for Managers on Water Challenges and Opportunities</i> 	
Week 2		
January 16	Topic: Groundwater Reading: <ul style="list-style-type: none"> • Cech, Ch 4 	
January 18	Topic: Overview of the Safe Drinking Water Act and Groundwater Management Programs Readings: <ul style="list-style-type: none"> • U.S. EPA. 2004. <i>Understanding the Safe Drinking Water Act</i> • <i>Overview of Michigan's Wellhead Protection Program</i> • <i>Michigan's Source Water Assessment Program</i> In-class exercise: Using Michigan's Groundwater Data	Homework #1 Assigned
Week 3		
January 23	Topic: <i>Tapped</i> (documentary) Readings: <ul style="list-style-type: none"> • <i>Overview of FDA Bottled Water Regulations</i> (website) • <i>MDARD and DEQ Bottled Water Regulation. OAG Performance Audit Report. 2017.</i> 	

January 25	Topic: Overview of the Clean Water Act Readings: <ul style="list-style-type: none"> Copeland, C. 2010. <i>Clean Water Act: A Summary of the Law</i> <p>In-class exercise: Clean Water Act Case Studies</p>	
Week 4		
January 30	Topic: Runoff, Erosion, Stream Flow Readings: <ul style="list-style-type: none"> Cech, Chapter 3 UNEP GEAS. <i>The future of the Aral Sea lies in transboundary cooperation</i>. 2014. 	Group Project Discussion
February 1	Topic: Wetlands Readings: <ul style="list-style-type: none"> Cech, pp 415-421 Wetlands Case Study Background 	Homework #1 Due
Week 5		
February 6	Topic: Wetlands (Cont.) and Water Quality Monitoring Readings: <ul style="list-style-type: none"> Cech, Ch 5 Copeland, C. 2012. <i>Clean Water Act and pollutant total maximum daily loads (TMDLs)</i>. 	
February 8	Topic: Water Quality Monitoring (<i>continued</i>) Readings: <ul style="list-style-type: none"> <i>Bacteria and Water Quality</i>. Chapter 2 in: Citizens Monitoring Bacteria: A training manual for monitoring E. coli <p>In-class exercise: MDEQ 303D Report Review</p>	

Week 6		
February 13	Topic: Lake Processes Reading: <ul style="list-style-type: none"> Moore, M.L. 1989. <i>NALMS. Water on the Web</i>. Understanding: Lake Ecology Primer (skim this document) 	Group Project Outlines Due
February 15	Topic: Agricultural Water Management Readings: <ul style="list-style-type: none"> Cech, pp. 202-215 <i>Michigan's Right to Farm Program and GAAMPs</i> 	
Week 7		
February 20	Topic: Agricultural Water Management, <i>continued</i> Readings: <ul style="list-style-type: none"> CAFO case study 	
February 22	Topic: Watershed Management Planning Reading: <ul style="list-style-type: none"> <i>Developing a Watershed Management Plan for Water Quality: An Introductory Guide</i> (skim this document) 	
Week 8		
Feb. 27	Topic: Watershed Management Planning, <i>continued</i> Readings: None In-class exercise: Evaluating Watershed Management Plans	
March 1		Midterm Exam
Week 9		
March 6, 8	Spring Break – No Classes	

Week 10		
March 13	Topic: Residential Water Resources Management and Onsite v. Municipal Wastewater Treatment Systems Readings: <ul style="list-style-type: none"> • Cech, Ch. 11 • Loudon. <i>Septic System FAQs</i> • MDEQ <i>Water Well Drilling Methods</i> 	
March 15	Topic: Aquatic Exotic Species Guest Lecturer: <i>Dr. Lois Wolfson, MSU Institute of Water Research and FW)</i> Reading: <ul style="list-style-type: none"> • <i>A Field Guide to Aquatic Exotics</i> 	Homework #2 Assigned
Week 11		
March 20	Topic: Field Trip – East Lansing Water Resource Recovery Facility (aka Wastewater Treatment Plant) (tentative) Readings: <ul style="list-style-type: none"> • East Lansing Wastewater Treatment Plant Process and Flow Map 	
March 22	Topic: Field Trip – East Lansing –Meridian Water Plant (tentative) Reading: <ul style="list-style-type: none"> • <i>Safe Drinking Water Act: Drinking Water Treatment</i> 	
Week 12		
March 27	Topic: Storm Water Management Reading: <ul style="list-style-type: none"> • <i>Design of LID Systems</i> in: Low Impact Development and Sustainable Storm Water Management. 2012. 	
March 29	Topic: Field Trip – Tollgate Wetlands (tentative) Reading: <ul style="list-style-type: none"> • Tollgate Wetlands Overview 	Homework #2 Due

Week 13		
April 3	Topic: <i>Cadillac Desert</i> (documentary) Readings: <ul style="list-style-type: none"> Cech, Ch 8 and 9 	
April 5	No Class - Work on Group Project	
Week 14		
April 10	Topic: Water and Conflict Readings: <ul style="list-style-type: none"> Cech, Ch 13 and 14 Shulte. <i>The Great Lakes Water Agreements</i>. In: World's Water Volume 7. 2012. Waukesha, WI – MI Technical Review <p>In-class exercise: Waukesha Case Study</p>	
April 12	Topic: Michigan's Water Withdrawal Legislation Readings: <ul style="list-style-type: none"> Seedang and Norris. <i>Water Withdrawals and Water Use in Michigan</i>. MSU Extension Bulletin WQ-62. Feb. 2011 	
Week 15		
April 17	Topic: <i>Flow</i> (documentary) Readings: None	
April 19	Topic: Group Project Presentations	

Week 16		
April 24	Topic: Group Project Presentations	
April 26	Group Project Presentations; Wrap Up, Review Readings: <ul style="list-style-type: none"> • Cech, Ch 15 • MDEQ. 2016. <i>Michigan's Water Strategy Executive Summary</i> 	All Semester Project Materials Due
FINAL EXAM: Thursday, May 3, 3:00-5:00 pm		