



ENVE 140 Water Resources Management

Spring 2018

Tuesday & Thursday 1330-1445

KL 276

Instructor: Professor Joshua Viers (jviers@ucmerced.edu) Office: 375 SE2

Office Hours: 1100-1200 Wednesdays unless noted, by appointment, and as announced

Course Description: Introduction to water resources planning and management, with an emphasis on California water problems. Water planning theory will form the basis for exploring applied analytical and quantitative methods in the field, including systems analysis, risk assessment, and geospatial modeling. A design project will focus on solving contemporary water management problems.

Prerequisites: ENVE/ESS 110; *waived with consent from instructor*

Course Goals: This course will introduce students to contemporary water resources problems, and provide students with analytical techniques for analyzing and understanding water problems and their potential solutions.

Course Learning Outcomes:

Upon completion of this course, students will be able to:

- 1) Explain contemporary water problems in California;
- 2) Perform systems analyses on specified water problems, and interpret hydrologic and geospatial models;
- 3) Estimate the potential impact of engineering solutions through risk assessments; and
- 4) Design an engineering solution for contemporary water management problems.

Water resources management as applied in the California context requires:

- a) the knowledge and application of mathematics, science, and engineering;
- b) an ability to design and analytically evaluate water resource systems, components, or processes to meet desired societal objectives within realistic economic, environmental, and social constraints;
- c) an ability to communicate effectively in often contentious situations with deeply held beliefs;
- d) an understanding of the impact of water resource and environmental engineering solutions in a global, economic, environmental, and societal context;
- e) as well as knowledge of contemporary water resource issues, broadly encompassing surface water and ground water quantity and quality.



Course Requirements and Grading

General Policies:

- Academic honesty is fundamental. Students will be held to the UC Standards of Conduct and the UC Merced Academic Honesty Policy. It is up to you to know the contents of these standards and policies. Presume that all work in this course is to be conducted and completed independently unless told otherwise for a specific assignment.
- Modern society is deadline driven and there are no make-ups or do-overs or baby-bounces. As such, make-up exams will not be scheduled unless due to extreme hardship and as prior approved by instructor. Further, no project or assignment will be accepted for grading after its due date. Partial credit is better than none.
- Effective written and spoken communication is fundamental to solving global water problems. Hence, as a general rule, you will be down-graded for poor writing and poor grammar. Do it correctly and you will be doing it right.
- Email is the preferred form of communication. If you need to call me, please use 209-591-8423 and leave a voicemail. I usually have my ringer turned off, but I will try to respond to you in a timely fashion (< 24 hrs). Please keep in mind that I travel frequently and often do not have cell/internet access.
- **Please use email** rather than CatCourses to communicate with me, as CatCourses is imperfect.
- Guest lecturers are an important part of the learning experience; they should be treated with the utmost respect as they are donating their time and expertise to enrich your learning opportunity in this class. **Absenteeism and poor behavior (e.g., sleeping) will be reflected in class scores.**
- **IMPORTANT: no cell phone use in class.** If you are on your phone during lecture, you will be asked to leave.
- **This syllabus, and especially the schedule, is subject to change.** You will be given plenty of notice.

Reading:

There are two texts and several electronic readings required for this class. The two texts (Mount / Hanak et al.) are complementary and will be read in parallel. The journal readings are intended to provide context to specialized water resource issues. The dates and chapter ranges are intended as a guide. The material issued prior to exams will be on the exams. For example, the first set of readings in Mount is nine chapters in 4 weeks. You should be reading at least two chapters a week, or one chapter for each class meeting. Ancillary readings are important too, so set a schedule and keep up.



Primary Textbooks:

1. Mount, J. F. (1995). California Rivers and Streams: the conflict between fluvial process and land use. University of California Press.
2. Hanak, E., (2011). Managing California's water: from conflict to reconciliation. Public Policy Institute of California. [electronic version provided to you on CatCourses]

Other textbooks of interest, though not required:

Mays, Larry (2009). Water Resources Engineering (2nd Edition). Wiley.

Bedient, P. et al. (2008) Hydrology and Floodplain Analysis (4th Edition). Pearson.

Secondary readings (available as electronic pdf documents, to be posted):

1. Lund, J.R. (2016). California's Agricultural and Urban Water Supply Reliability and the Sacramento–San Joaquin Delta. *San Francisco Estuary & Watershed Science*. 14(3):6
2. Yarnell, SM, JH Viers, and JF Mount. (2010) Ecology and Management of the Spring Snowmelt Recession. *BioScience* 60(2): 114–27
3. Nelson, B. (2017). 21st Century California Water Storage Strategies. *San Francisco Estuary & Watershed Science*. 15(4):1
4. Christian-Smith, J. et al. (2015). Maladaptation to drought: a case report from California, USA. *Sustainability Science*. 10:491-501
5. Grantham, T. & Viers, J. H. (2014). 100 years of California's water rights system: patterns, trends and uncertainty. *Environmental Research Letters* 9:091005.
6. Mount, J., & Twiss, R. (2005). Subsidence, sea level rise, and seismicity in the Sacramento-San Joaquin Delta. *San Francisco Estuary and Watershed Science*, 3(1).
7. Milly, P.C., et al., (2008). Stationarity is dead: Whither water management?. *Science*, 319(5863), pp.573-574.
8. Vörösmarty, C. J., et al. (2000). Global water resources: vulnerability from climate change and population growth. *Science*, 289(5477), 284.

Additional Resources:

I will be posting a number of additional resources throughout the semester. These include:

1. Short briefings from the Public Policy Institute of California (ppic.org)
2. Videos of important topics



Final Exam Writing Assignment (12 points):

A take home writing assignment, distilling elements from the entire course including guest lectures, will be given at the end of the term. Using your own perspective on contemporary water issues and technical knowledge from the class, you will submit a 1500-word answer to a provided prompt.

Final Exam (42 points):

The final examination is scheduled for **May 11th (11:30-6:00pm)**. It will be comprehensive.

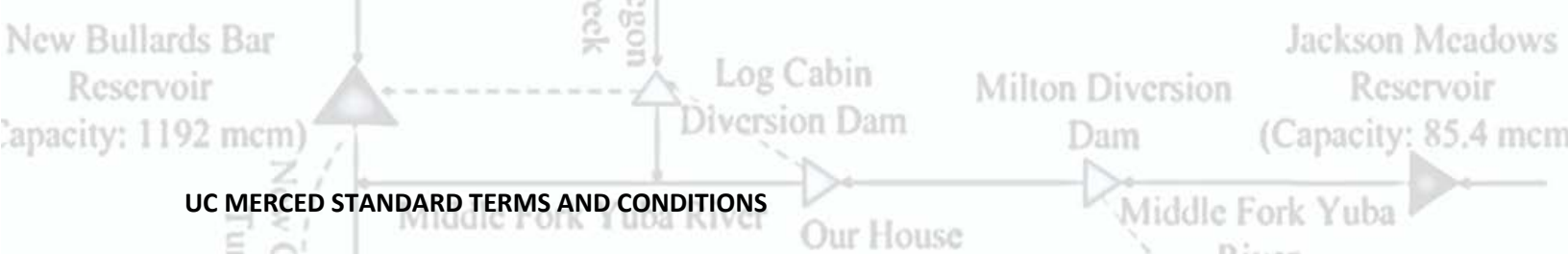
Extra Credit (10 points):

There are two optional guest lectures. Prof. Mark Rains from the University of South Florida will be discussing vernal pool hydrology on Wednesday March 21st and Professor Emeritus Jeff Mount (and author of your text book) will be discussing ground water management on Wednesday April 4th. Both lectures are from 12:30-1:45 in COB1 113 unless otherwise noted. A short write up (500 words) in response to a prompt from the speaker will be accepted for 5 pts each.

Tentative Class Schedule: A brief breakdown follows below.



Class	Day of the Week	Date	Points	Due	Topic	Assignment	Mount	Hanak	Other	
1	Tuesday	16-Jan			LOGISTICS	HW 1	Ch 1-9	Ch 1-2		
2	Thursday	18-Jan			Water Resources					
3	Tuesday	23-Jan	8	HW 1		HW 2			Lund	
4	Thursday	25-Jan								
5	Tuesday	30-Jan	8	HW 2		HW 3				
6	Thursday	1-Feb							Yarnell	
7	Tuesday	6-Feb	8	HW 3						
8	Thursday	8-Feb								
10	Tuesday	13-Feb	32	MIDTERM						
11	Thursday	15-Feb			Water Resources Management	HW 4	Ch 10-17	Ch 3-6		
12	Tuesday	20-Feb							Nelson	
13	Thursday	22-Feb	8	HW 4		HW 5				
14	Tuesday	27-Feb								
15	Thursday	1-Mar	8	HW 5					Christian-Smith	
16	Tuesday	6-Mar								
17	Thursday	8-Mar	32	MIDTERM						
18	Tuesday	13-Mar	PROJECTS							
19	Thursday	15-Mar								
20	Tuesday	20-Mar								
EC	WEDNESDAY	21-Mar	ES SEMINAR with Prof. Mark Rains (Univ South Florida)							
21	Thursday	22-Mar	PROJECTS							
22	Tuesday	27-Mar	SPRING BREAK							
23	Thursday	29-Mar								
24	Tuesday	3-Apr							Grantham	
EC	WEDNESDAY	4-Apr	ES SEMINAR with Prof. Jeff Mount (UC Davis, PPIC)							
25	Thursday	5-Apr			Case Studies & Guest Lectures		Ch 7-10			
26	Tuesday	10-Apr						Mount/Twiss		
27	Thursday	12-Apr								
28	Tuesday	17-Apr								
29	Thursday	19-Apr						Milly		
30	Tuesday	24-Apr								
31	Thursday	26-Apr								
32	Tuesday	1-May	12			Final Essay			Vörösmarty	
33	Thursday	3-May	42		Exam Review	Final Project				
	FRIDAY	11-May	42	FINAL EXAM 11:30-2:30 KL 296						



UC MERCED STANDARD TERMS AND CONDITIONS

Academic Integrity:

- a. Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy. Any work submitted by a student in this course for academic credit will be the student's own work.
- b. You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e mail, an e mail attachment file, a diskette, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Policy can also be extended to include failure of the course and University disciplinary action.
- c. During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.

Accommodations for Students with Disabilities: The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.