

Water Management for Human and Environmental Systems

MES, Winter Quarter, 2015

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Class Meetings: Wednesday evenings, from 6:00 PM to 10:00 PM.

Description

This class will explore how we manage water to meet the often-conflicting needs of human society and of the freshwater ecosystems upon which we value and rely. Issue areas will include water supply, water quality, stormwater and flooding, fisheries and endangered species, and watershed ecological functions.

A key organizing principal of the class will be Integrated Water Resources Management, which is a tool for sustainable water management. In this course, we will review the science of water, and then explore how human communities interact with watersheds and the water environment. Then we will examine our legal, economic, and social structures for water management to understand how social and environmental needs intersect. The course will conclude by comparing how water management differs globally between rich and poor nations, and look ahead to the emerging challenges of climate change.

Students will apply class concepts by researching individual case studies, which they will present in a technical paper and class presentation.

Course Objectives

- Learning and understanding:
 - *Physics, chemistry and biology of water*
 - *Water hydrology and meteorology*
 - *Water quantity, quality, and pollution*
 - *Watersheds and ecosystem function*
 - *Water policy, laws, and management*
 - *Water sustainability and social justice*
 - *Global water and privatization*
- Developing and enhancing:
 - Research and analysis skills
 - Communication skills, including writing, group discussion and decision-making, and oral presentation

Class Resources

- Presentations by the instructor and guest speakers
- Selected readings from assigned books, and additional readings from websites or electronic documents
- Weekly writing assignments on the readings
- Seminars on leading-edge water controversies assigned by the instructor
- In-class exercises and discussions and computer laboratory exercises
- A class project with a short final paper and presentation based on a real world water issue of interest to the student.

Attendance and Course Credit

Students are expected to attend all scheduled classes. Participation in class is an important part of the learning process for all the students in the course. Students may be excused for unavoidable conflicts only with prior approval from the instructor. Unexcused absence from the class can result in a partial loss of class credit.

Expectations and Evaluation

The instructor will evaluate students based on their ability to understand course concepts, and to analyze and integrate the concepts into a deeper understanding of the issues presented during the course. Full credit will be based on the following criteria:

- Class participation. Water is a diverse and broad subject area. Shared learning and teaching are critical elements of this class. All students are expected to participate in class through group discussions, formal and informal presentations and information sharing, feedback to peers, and by helping to facilitate topic discussions. Individual styles differ and will be taken into account. Each student is encouraged to find a way to stimulate discussion and thinking, enhance the learning of both yourself and your fellow students, and contribute in class in his or her own unique way.
- Reading and writing assignments. Assigned readings are essential – the analysis of readings and discussion of readings in class will enhance and expand learning. Students are expected to complete assigned readings and provide the written assignments prior to the class, and demonstrate their comprehension in class discussions and assignments.
- Class Seminars. Students will research their assigned topic, make presentations in class, and lead the class in a discussion of the seminar topic. Students should demonstrate their understanding of the topic and its relationship to course concepts through their presentations and seminar discussion leadership.
- Final project paper and presentation.
An important part of this class (about half the credit) will be a research paper on a topic selected by the student. Students are encouraged to propose a topic to the instructor, but may also choose a topic suggested by the instructor. Expectations are that the student, in a timely fashion, will provide an abstract, draft paper, and final paper, and make a presentation.
The paper should be 10 to 12 pages (single-spaced) of text (additional pages for figures, tables, and references is acceptable). References should be original source, such as peer-reviewed articles or professional books or reports – popular press reports should be used sparingly and Wikipedia and other secondary internet sources may not be used as references.
Evaluations will be based on students demonstrating the effort spent in their research; integration of the course concepts into their project; and the clarity, originality, and academic quality of their work.

The instructor expects all students to submit to the instructor:

- Weekly writing assignments, which are due by the start of class.
- An abstract of their topic, a draft paper, a presentation of the topic, and a final paper, all in a timely fashion based on the following schedule:
 1. **Sunday January 11:** Draft abstract of research paper topic (300 words or less)
 2. **Wednesday February 25th:** First draft of research paper
 3. **Wednesday March 4th or 11th (weeks 9 and 10):** Presentation of research paper
 4. **Wednesday March 18th (evaluation week):** final research paper

Books for this class:

- *Mountain in the Clouds: A Search for the Wild Salmon* – Bruce Brown
- *Cadillac Desert: The American West and Its Disappearing Water* – Marc Reisner
- *Watershed: The Undamming of America* – Elizabeth Grossman
- *River Republic - The Fall and Rise of America's Rivers* – McCool, Daniel
- *Voyage of a Summer Sun: Canoeing the Columbia River* – Robin Cody
- *Water Wars: Privatization, Pollution and Profit* – Vandana Shiva