

## **CE 545**

### **Management and Monitoring of Water Quality**

Fall 2005

#### Course Outline

**Objective:** A study of society's efforts to sustain the quality of its water resources via acquisition of appropriate and relevant information about water quality conditions and the use of the information within a water quality management program.

**Instructor:** Robert C. Ward (Civil Engineering Department)  
Colorado Water Resources Research Institute  
E-102 Engineering Building  
Colorado State University  
Fort Collins, Colorado 80523  
Phone: (970) 491-6308  
Fax: (970) 491-1636  
E-mail: Robert.Ward@Colostate.edu

**Text:** No formal text. On-line text, prepared by the instructor, is used with each topic discussed along with references (mostly via internet links) to laws, regulations, monitoring reports, monitoring guidelines and journal articles.

**Operation:** The course will consist of a combination of lectures by the instructor, presentations by invited speakers, student discussions of review questions, and questions from students.

**Grading:** Quizzes and Final (67%)  
Class preparation (33%)

**Time/place:** 2:10-3:25pm Tuesday and Thursday  
B-1 Engineering Building

CSUN students should submit all homework and exams to Robert Ward at the above address.

## **CE 545**

### Management and Monitoring of Water Quality

Course Lecture Schedule

Fall 2005

<b>DATE</b>	<b>TOPIC</b>
August 23	Guest Lecturer - Prof. <b>Tom Sanders</b> , Civil Engineering Department - presents his perspective on water quality management and monitoring; reviews the history behind CE 545; and discusses related water quality courses at CSU (e.g. CE 521, CE 547, and CE 623).
August 25	Water Quantity Law: Context for Water Quality Management in the West – Guest Lecturer <b>Mariam J. Masid</b> , Water Rights Specialist, Bureau of Reclamation, Eastern Colorado Area Office, Loveland
August 30	Course (Monitoring and Management) Purpose, Schedule, Assignments, Grading
September 1	History of Water Quality Management
September 6	Water Quality Management Laws
September 8	Institutional Arrangements to Implement Laws [ <b>Homework No. 1 due</b> ]
September 13	Criteria and Standards
September 15	Permits and Enforcement - Abatement
September 20	Financial Aid and Planning (Research and Monitoring) - Prevention [ <b>Homework No. 2 due</b> ]
September 22	Total Maximum Daily Loads (TMDLs) – New Terminology for Traditional Pollution Prevention Strategies
September 27	<b>FIRST QUIZ</b>
September 29	Guest Lecturer

October 4	Context for Design of Water Quality Monitoring Systems
October 6	Guest Lecturer
October 11	Defining the Water Quality ‘Information’ (Monitoring) System
October 13	Monitoring Design Strategies
October 18	Quantifying Information Goals (for Management and Monitoring)
October 20	Reporting Options
October 25	Data Analysis Protocol [ <b>Homework No. 3 due</b> ]
October 27	Data Analysis Options (NWQMC Technical Report 01-01)
November 1	Preparing Water Quality Data for Analysis: Troubling Attributes
November 3	Guest Lecturer – Prof. <b>Jim Loftis</b> , Civil Engineering Department. Additional insights into statistical approaches for analyzing water quality data and CE 547 in spring semester
November 8	Data Analysis Methods Overview (Excursion Analysis Demo)
November 10	<b>SECOND QUIZ</b>
November 15	Data Management and Analysis Software – IT in Monitoring
November 17	Network Design (Where, What, and When of Sampling)
November 29	Documenting Day-to-Day Monitoring Program Operations
December 1	Found Data (Secondary Data Products) and Peer Review <b>[Homework No. 4 due]</b>
December 6	Monitoring Councils and National Water Quality Monitoring Network Design Update
December 8	Semester Review, Final Exam Prep, and Course Evaluation
December 16	<b>FINAL EXAM</b> (7:00am – 9:00am) or
December 13	<b>FINAL EXAM</b> (11:20am - 1:20pm)