

Summer Course Offering

CEE 498FM: WATER RESOURCES FIELD METHODS

Summer Session II, June 11-22 2007, Class hour and location: Lecture: 9:00 A.M.to1:00 P.M M,W in 1518 Hydrosystems Lab; Laboratory/Field : 9:00 AM to 4:00 PM Tu/Th
Credit: 3 hours

Instructors

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Course Description: This course will emphasize: (1) scientific principles behind measurement technologies and protocols used for water-resources measurements; and (2) experimental design for field-scale water-resources and environmental studies. This course will include discussion sections where the theoretical bases and scientific principles of different measurements and sampling strategies will be discussed, along with several field trips to observe and participate in using the methods that have been discussed. The field trips will examine real-world problems (e.g., what is the anticipated effect of removal of a dam) and the monitoring that would be needed to support making decisions about such problems.

The instructors for this course will include experts from the U.S. Geological Survey, Illinois Water-Science Center, as well as Dr. Arthur Schmidt.

Prerequisites: Students should have the basic hydrologic and hydraulic background equivalent to CEE 350 “Water Resources Engineering,” and TAM 335 “Introductory Fluid Mechanics”. Students should have an introduction to probability and statistics equivalent to CEE 202, “Engineering Risk & Uncertainty.”

Course Outline:

- I. Introduction, Experimental Design, Program Planning
 - A. Introduction, Measurement vs Calculation vs Estimation
 - B. Hypothesis testing and Experimental Design
 - C. Uncertainty and Error Analysis
- II. Surface-Water Measurements and Methods
 - A. Open-Channel Hydraulics
 - B. Measurement Principles
- III. Sediment Measurement and Methods
 - A. Sediment Hydraulics
 - B. Measurement Principles
- III. Water-Quality Measurements and Methods
 - A. Water-quality principles—
Measurement principles, chemical compatibility, quality assurance
 - B. Sample Collection—flowing and non-flowing water sites
 - C. Sample preparation
 - D. Field Measurements
- IV. Groundwater Measurements and Methods
 - A. Groundwater Hydraulics and Principles
 - B. Well Construction
 - C. Hydraulic Tests and Measurements
 - D. Groundwater-quality sampling

