Department of Civil and Environmental Engineering

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

College of Engineering
DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

CEE 350: WATER RESOURCES ENGINEERING
Professor Megan Konar
Fall 2025

Class Time: MWF 10:00am – 10:50am
Class Location: 3310 Newmark
E-mail: mkonar@illinois.edu
Office: 3022 Civil Engineering Hydrosystems Lab
Office Hours: Fridays 11:00am-12:00pm, or by appointment

COURSE DESCRIPTION

This course will introduce hydrology, hydraulics, and engineering applications of water resources. This course provides a foundation for more specialized courses in Water Resources Engineering and Science (WRES). The course is primarily lectures, supplemented with slides and other media. The emphasis of the course will be on material presented in class.

COURSE OBJECTIVES: Throughout this course, students will 1) analyze fundamental principles of hydrology, 2) apply hydraulic design principles, 3) understand water resources systems, and 4) advance communication and analytical skills to solve water resources problems.

COURSE WEBSITE: http://canvas.illinois.edu

TEXTBOOK: Chin, David A. (2021). Water-Resources Engineering. 4th edition*. Pearson: Boston. ISBN: 0-13-670710-6.
*3rd or 4th edition is fine

ASSIGNMENT POLICIES

Homework assignments will take place throughout the semester to reinforce the technical and mathematical concepts from class. Students should form groups to work in throughout the semester. Each student is responsible for understanding the material on each assignment.

SCIENTIFIC PAPER OF THE WEEK

Students will work in groups to present a scientific article to the rest of the class at the beginning of lecture each Wednesday. The purpose of these presentations is to learn how to read and understand dense scientific material, gain experience communicating scientific findings, and to recognize that cutting edge work related to course content is ongoing.

Short scientific articles have been selected from top academic journals related to topics covered in the course. The students will deliver a 12-minute presentation. Notecards may not be used to present. Each group is then in charge of the discussion the week following their presentation. This means that the discussion group should solicit questions from the rest of the class and have prepared questions of their own.

All students should read the article each week, as participation in the weekly discussion is part of the participation grade.

MIDTERM EXAMS

The midterm exams will be in class. Topics covered by each exam will be described in class. Exams will be closed book, but a one-page (handwritten) note sheet will be allowed. The midterms are scheduled for the following dates:

Midterm #1	October 13th
Midterm #2	November 17th

FINAL EXAM

The final exam will be cumulative and is scheduled for December 18th from 8:00-11:00 AM.

GRADING

Attendance and participation*	5%
Journal paper presentation	10%
Homework	20%
Exam 1	20%
Exam 2	20%
Final exam	25%

*Grading for attendance and participation will be assessed based on sign-in sheets and participation in class during lectures and discussions. More than 3 unexcused absences will reduce the attendance grade.

Letter grades will be assigned using a plus/minus system, as below:

A	93.0 – 100%	B-	80.0 – 82.9%	D+	67.0 – 69.9%
A-	90.0 – 92.9%	C+	77.0 – 79.9%	D	63.0 – 66.9%
B+	87.0 – 89.9%	C	73.0 – 76.9%	D-	60.0 – 62.9%
B	83.0 – 86.9%	C-	70.0 – 72.9%	F	00.0 – 59.9%

Late assignment policy: Late assignments will not be accepted. These are group assignments, which should be a fun and collaborative exercise. However, I expect your team to meet the deadline and for every team member to make a good contribution. Any team disputes should be resolved prior to the deadline. With prior approval of the instructor, students who do not contribute to their group work may submit their own individual assignment up to one week late for up to 50% credit. Students are welcome to submit their own individual assignment prior to the deadline for full credit.

Make-up exam policy: Make-up exams are not allowed. In the case of an excused absence (i.e., a legitimate excuse that has prior approval of the instructor), the final exam grade can be used in lieu of a midterm grade.

Schedule

*Please note that this is a provisional schedule and changes and updates are possible.

Date(s)	Topic	Textbook (Chin, 3rd ed.)	Reading (journal paper presentation date)
Aug 25, 27 Sept 3	Introduction • Water systems • Water cycle • Watersheds	1.1-1.3	Paper 0 (Aug 27) Paper 1 (Sept 3)
HYDROLOGY			
Sept 5, 10, 12	Precipitation • Watershed mapping • Definition, duration, and distribution • Extreme rainfall events	9.1-9.2	Paper 2 (Sept 10)
Sept 15, 17, 19	Infiltration • Infiltration processes • Models: Horton, Green-Ampt, NRCS curve-number	9.3	
Sept 22, 24, 26	Runoff and Streamflow • Runoff models • Streamflow measurement • Hydrographs	9.4, 10.1-10.5	Paper 3 (Sept 24)
Sept 29, Oct 3, 6, 8	Groundwater • Porous media characteristics • Darcy's Law • Governing equations • Aquifers and wells • Pumping	14.1-14.5 15.1-15.6 16.1-16.3	Paper 4 (Oct 3)
Oct 13	**Exam 1**		

HYDRAULICS			
Oct 15, 17	Hydraulic structures • Culverts, wiers, and spillways • Dams and reservoirs	7.1-7.1	Paper 5 (Oct 15)
Oct 20, 22, 24, 27	Water Distribution Systems • Pipes, pumps, and valves • Demand and design flows • Hydropower	2.1-2.3, 3.1-3.5	Paper 6 (Oct 22)
Oct 29, 31	Hydropower • Reservoir profiles • Hydropower design	7.7-7.8	Paper 7 (Oct 29)
Nov 3, 7, 10, 12	Open Channel Flow • Continuity and momentum equations • Water-surface profiles	4.1-4.3	Paper 8 (Nov 12)
Nov 17	**Exam 2**		
Dec 1, 3, 5, 8	Drainage Systems • Principles, slopes, and freeboard • Channel design	5.1-5.5	Paper 9 (Dec 3)
Dec 18	**Final exam (8:00-11:00 AM)**		