

CEE 437 - Water Quality Engineering
Fall 2026

Instructor	Ran Mei 3209 Newmark Civil Engineering Laboratory (NCEL) Email: ranmei2@illinois.edu Departmental profile: https://cee.illinois.edu/directory/profile/ranmei2 Personal homepage: https://meiranmeiran.github.io/	
Lecture	Tuesday & Thursday, 3:30-4:50 PM; 1311 NCEL	
Office Hours	Thursday, 5:00-6:00 PM; 3209 NCEL & Zoom (links on Canvas). Meeting at another time is welcome and is by appointment.	
For Online Attendance	Recorded lecture (will be posted on Canvas shortly after the class) & live Zoom meeting (links on Canvas).	
Canvas Page	https://canvas.illinois.edu/courses/71286	
Prerequisites	CEE 330 and credit or concurrent registration in TAM 335 (See the instructor if you have any questions)	
Text	Water and Wastewater Treatment Design Principles and Practice, by Mackenzie L. Davis, McGraw-Hill, Second Edition, ISBN: 9781260132274. Available online through engineering library Water chemistry: the chemical processes and composition of natural and engineered aquatic systems Brezonik, Patrick L., author.; Arnold, William A., New York, NY : Oxford University Press; 2022 Available online through engineering library	
Course Objectives	The goals of this course are to help students: • Understand the chemical, physical, and biological principles governing water treatment processes. • Identify major water treatment processes and their applications. • Design conceptual treatment systems to address diverse wastewater challenges. • Integrate sustainability principles into water treatment and environmental engineering practices.	
Performance Evaluation	Homework (4 assignments) 20% Exam 1 20% Exam 2 20% Exam 3 20% Project: <i>Faucet and Drain Science</i> Podcast 20%	
	The instructor will guarantee the following grade “floors”: Students scoring 97% or more of final grade will receive an A+, 93-97% for A, 90-93 for A-, 87-90% for B+, 83-97% for B, 80-84% for B-, 77-80% for C+, 73-77% for C, 70-73% for C-, 67-70% for D+, 63-67% for D, 60-63% for D-.	
Attendance	Not taken. In-class interactive learning activities, such as quiz, practice, Muddiest Points (please post questions/suggestions/comments by the end	

	of the day of the lecture), is designed to help you learn, <u>NOT</u> for grading and taking attendance.
Homework	Problem sets will be announced and posted on Canvas at least 7 days prior to the due date. Homework assignments are due at the start of class (3:30 PM) on the due date . Assignments turned in up to 24 hours late will incur a 25% penalty, 24-48 hours late a 50% penalty, and will not be accepted more than 48 hours after the due date.
Treatment Plant Tour	The class will organize a visit to the Illinois American Water treatment plant at the end of October. The objective of the field trip is to evaluate design and operation of a full-scale treatment plant based on what you have learned in this class. Questions will be included after the visit as part of homework #3.
Exams	Three exams. Not cumulative. Closed book. Single-page, hand-written note is allowed.
Podcast project	A podcast project that helps students practice communicating water engineering and science to public audience.
Academic Integrity	All students at the University of Illinois are expected to uphold the highest ethical standards, be honest, and practice academic integrity in this class. Campus policies and procedures are set forth in the Student Code, Article 1, Part 4 (http://studentcode.illinois.edu/FullCode_web2016-17.pdf). Students are expected to produce original work and properly cite any sources used. <u>Plagiarism will not be tolerated</u> . Students with questions about plagiarism should read section 1-402(b) of the Student Code (http://studentcode.illinois.edu/FullCode_web2016-17.pdf) and should contact the instructor with any questions.
Use of Generative AI	Encouraging Ethical Use: Students are encouraged to use AI <u>tools as aids</u>, not as substitutes for their own effort, creativity, and critical thinking. Permitted Uses: • Brainstorming: Students may use ChatGPT to generate ideas, explore new concepts, or outline potential approaches to assignments. • Supplemental Learning: AI tools can be used to clarify difficult concepts or as an additional resource for understanding the course material. • Writing Assistance: Grammar and style suggestions, organizing thoughts, and generating drafts are acceptable uses, as long as the final submission is the student's own work. Prohibited Uses: • Uncredited Content: Submitting AI-generated responses, text, or solutions without proper acknowledgment is considered plagiarism. • Exams: Use of AI tools is strictly prohibited during exams, quizzes, or any form of assessment unless explicitly allowed by the instructor. • Avoidance of Effort: Using AI to bypass learning objectives, such as generating complete assignments, essays, or problem solutions, is not permitted. Critical Thinking Requirement: Students must critically evaluate the content provided by ChatGPT. They are responsible for ensuring the accuracy and quality of their submissions and aligning them with the course objectives.

Acknowledgment: Any use of ChatGPT or similar tools must be cited appropriately. For example, students should include a brief note in their assignment such as: "This assignment was developed with the assistance of ChatGPT to outline initial ideas."

Instructor's Discretion: The instructor reserves the right to review individual uses of ChatGPT and determine whether they align with the academic integrity policy and the spirit of the assignment.

***This entire section is generated by ChatGPT**

Students with Disabilities

To obtain disability-related accommodations for this class, students are advised to contact the course instructor and the Division of Disability Resources and Education Services (DRES) as soon as possible. Please contact the instructor after class, at his office anytime, by phone, or by email to discuss your needs. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TDD), or e-mail to disability@illinois.edu.

Mental Health

Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Student Health Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you.

Counseling Center (217) 333-3704

- McKinley Health Center (217) 333-2700

- National Suicide Prevention Lifeline (800) 273-8255

- Rosecrance Crisis Line (217) 359-4141 (available 24/7, 365 days a year)

If you are in immediate danger, call 911.

*This statement is approved by the University of Illinois Counseling Center.

Course Schedule (tentative)

Week	Lecture	Date	Topic 2026
1	1	Tue., Aug 25	Course Introduction; Overview of Water Quality
1	2	Thu., Aug 27	Acid-Base Equilibria
2	3	Tue., Sep 1	Carbonated Systems and Buffer
2	4	Thu., Sep 3	Alkalinity
3	5	Tue., Sep 8	Reaction Kinetics
3	6	Thu., Sep 10	Hydraulic Retention Time
4	7	Tue., Sep 15	Helping Session on Team Project
4	8	Thu., Sep 17	Review Session I
5		Tue., Sep 22	Exam I
5	9	Thu., Sep 24	Coagulation and Flocculation
6	10	Tue., Sep 29	Sedimentation
6	11	Thu., Oct 1	Granular Filtration
7	12	Tue., Oct 6	Softening
7	13	Thu., Oct 8	Softening + Disinfection
8	14	Tue., Oct 13	Disinfection cont. + Membrane Filtration
8	15	Thu., Oct 15	Membrane Filtration cont.
9	16	Tue., Oct 20	Adsorption
9	17	Thu., Oct 22	Drinking Water Distribution
10		Tue., Oct 27	Treatment Plant Tour
10	18	Thu., Oct 29	Review Session II
11		Tue., Nov 3	Exam II
11	19	Thu., Nov 5	Overview of Wastewater Treatment
12	20	Tue., Nov 10	Redox reactions
12	21	Thu., Nov 12	Redox reactions cont.
13	22	Tue., Nov 17	Activated Sludge
13	23	Thu., Nov 19	Water Reuse
14		Tue., Nov 24	Fall Break

14		Thu., Nov 26	
15		Tue., Dec 1	Team Project Demonstration
15		Thu., Dec 3	Review Session III
16	24	Tue., Dec 8	Exam III
16		Thu., Dec 10	
17		Mon., Dec 15	