Water Quality Control Processes II
Civil & Environmental Engineering (CEE) 538
Spring 2025

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/ Office Hours: Friday, 11:00-11:50 AM or by appointment
Course Meeting Time and Location	Monday/Wednesday, 10:00-11:50 AM; 1311 NCEL
For Online Attendance	Links to live Zoom meeting and recorded class will be provided.
Course Homepage	https://canvas.illinois.edu/courses/53192
Prerequisites	CEE 442, CEE 443, and CEE 444, or permission of the instructor
Textbooks	Metcalf & Eddy; Tchobanoglous, G.; Stensel, H.D.; Tsuchihashi, R.; Burton, F.L.; Abu-Orf, M.; Bowden, G.; and Pfrang, W. *Wastewater Engineering: Treatment and Resource Recovery*. **5th edition**. New York, NY: McGraw-Hill Education, 2014. ISBN 978-0073401188 [available as e-book at the UofI Libarary; one hard copy **was** available at the Grainger Engineering Library] *This book is a key reference on all aspects of wastewater treatment (including biological, physical, and chemical processes). The 5th edition is a thorough update - describing the rapidly evolving field of wastewater engineering technological and regulatory changes that have occurred over the last ten years in this discipline. No environmental engineering professional or civil or environmental engineering major should be without a copy of this book.* Rittmann, B. E. and McCarty, P. L. (2020): Environmental Biotechnology: Principles and Applications. **2nd edition**, New York, McGraw-Hill [available as e-book] *This book is a good reference for the fundamental concepts governing environmental biotechnology.* Michael T. Madigan, Kelly S. Bender, Daniel H. Buckley, W. Matthew Sattley, David A. Stahl (2015): Brock Biology of Microorganisms. **14th edition**, Hoboken, NJ : Pearson Education [any edition between the 13th to the 16th would be fine] *This book teaches the principles of modern microbiology. Includes both historical background and foundational aspects of microbiology, as well as a robust and modern treatment of microbiology with concrete examples of the microbial world.*

Course Description	Theory and its application for design and operation of processes used in water and wastewater treatment; emphasis is on biological treatment processes and related processes for gas transfer, sludge dewatering, sludge disposal, and solids separations. *4.0 Credit Hours.*
Course Objectives	The goals of this course are to help students: • **Identify** major wastewater treatment processes and their applications. • **Understand** the biological principles governing wastewater treatment processes. • **Design** conceptual treatment systems to address diverse wastewater challenges. • **Integrate** sustainability principles into wastewater treatment and environmental engineering practices.
Grading	Homework (x4) 20% (5% x4) Treatment Plant Trip Report 10% Water Topics Presentation 10% Midterm Exam 30% Final Exam 30%
Homework	Problem sets will be handed out at least 7 days prior to the due date. The due date will be announced when the homework is assigned. Homework assignments are due at the start of class (10:00 AM) 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. [Same policy for both in-person and online sections]
Treatment Plant Trip	The class will organize a visit to a local wastewater treatment plant in March or April. 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. Submit a written report after the visit, including responses to pre-assigned questions and a critical evaluation of the plant's design and operation. Additional details will be provided in the assignment handout. A video will be recorded for online students.
Water Topics Presentation	A short oral presentation (~10 min including Q&A) of a self-picked topic related to wastewater and water engineering, including but not limited to: research article of novel treatment technologies, critical evaluation of a treatment plant, case study of a city's water service, emerging concerns of public health and nature ecosystems. In addition to presenting, you will also be asked to submit a written summary of key messages of all the other presentations.
Exams	There will be one exam during the regular semester, and one at the end of the semester. Not cumulative. Closed book, closed notes, and will take place during the regularly scheduled class period. Relevant formulae and equations will be provided. Cell phones and other devices capable of wireless data transfer (including via wifi) may NOT be used during exams for any purpose (including as calculators). Acceptable items to be used in exams are limited to pens, pencils, erasers, and calculators.

Attendance Policy	Not taken. In-class interactive learning is designed to help you learn, NOT for grading and taking attendance.
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. Plagiarism will not be tolerated. 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 such as ChatGPT	**Encouraging Ethical Use**: Students are encouraged to use AI tools as aids, 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.