



蘇州大學
Soochow University

CEN 341 Chemistry for Water and Wastewater

Treatment

Winter 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email:TBA

COURSE OBJECTIVES

This course provides an in-depth exploration of the fundamental principles, processes, and technologies employed in the treatment of water and wastewater through physical and chemical unit operations. Topics include sedimentation, mixers, flocculation, mass transfer/aeration, filtration and more. It serves as a comprehensive foundation for understanding the critical unit processes essential for safeguarding public health and the environment.

Upon Completion of this Course, students will be able to:

1. Develop a deep understanding of the physical and chemical unit processes used in water and wastewater treatment systems;
2. Be equipped with the knowledge and skills required for the design, operation, and optimization of unit processes in water treatment facilities;
3. Gain problem-solving and critical thinking abilities for addressing real-world challenges in water quality management;
4. Develop a working knowledge of the key processes, equipment, and principles involved in water and wastewater treatment;
5. Gain a deep insight into the physical and chemical unit operations used in the treatment of water and wastewater.

PREREQUISITES

CEN 215 Fluid Mechanics; CEN 260 Introduction to Environmental Engineering



GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM	POINTS
3 Quizzes	30 Points
2 Homework	20 Points
Midterm 1	15 Points
Midterm 2	15 Points
Final Exam	20 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

Mackenzie L. Davis, *Water and Wastewater Engineering: Design Principles and Practice*, 2nd Edition, McGraw-Hill, 2020.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Water Demand Topic 2: Water Source Evaluation Topic 3: Coagulation Theory Topic 4: Flocculation Theory Assessments:



	Quiz#1
Module 2	Topics: Topic 5: Mixing Theory and Practice Topic 6: Theory of Granular Filter Hydraulics Topic 7: The Design and Construction Processes Topic 8: Designing for Safety and Hazardous Conditions Assessments: Quiz#2
Module 3	Topics: Topic 9: Flow Measurement and Flow Equalization Topic 10: Sedimentation Theory and Practice Topic 11: Sedimentation Basin Design Topic 12: Coagulation and Flocculation Assessments: Midterm#1 Quiz#3
Module 4	Topics: Topic 13: Secondary Settling, Disinfection, and Postaeration Topic 14: Granular Filtration Practice Topic 15: Membrane Filtration Topic 16: Lime-Soda Softening Assessments: Midterm#2 Homework#1
Module 5	Topics: Topic 17: Softening Processes Topic 18: Chemical Dosages Based on Stoichiometry Topic 19: Disinfection Topic 20: Emergency Disinfection Assessments: Final Exam Homework#2

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow



University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACADEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.



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DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.