



蘇州大學
Soochow University

CEN 416 Solid Waste Treatment

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

Students will explore the challenges, technologies, and strategies associated with the proper handling, disposal, and recycling of solid waste. Emphasis will be placed on sustainable and environmentally friendly practices, as well as the economic and social aspects of waste management. Specific topics mainly cover waste quantities and characteristics, storage and collection of solid waste, collection system, transfer and transport, materials recovery and recycling, disposal and landfill, combustion and energy recovery, and environmental issues.

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

1. Identify and categorize different types of solid waste, including hazardous waste, municipal solid waste, and industrial waste.
2. Perform life cycle assessments to understand the environmental impact of solid waste management strategies and make informed decisions for sustainable solutions.
3. Analyze real-world examples of successful and challenging waste management projects.
4. Evaluate and apply various technologies for waste collection, treatment, and disposal, considering environmental impact and sustainability.
5. Equip students with a holistic understanding of the complexities surrounding solid waste management.



PREREQUISITES

CEN 260 Introduction to Environmental Engineering

GRADING

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

| ITEM | POINTS |
|----------------|------------|
| 2 Quizzes | 20 Points |
| 2 Projects | 10 Points |
| Midterm | 25 Points |
| Research Paper | 15 Points |
| Final Exam | 30 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:

1. Rod Allan, Wim Salomons, *Solid Waste Management: Principles and Practice*, Ramesha Chandrappa, Diganta Bhusan Das, Springer-Verlag Berlin Heidelberg, 2012.
2. William A. Worrell; P. Aarne Vesilind, *Solid Waste Engineering: A Global Perspective*, 3rd Edition, Cengage Learning, 2017.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

| MODULE | TASKS |
|--------|-------|
|--------|-------|



| | |
|----------|---|
| Module 1 | <p>Topics: Topic 1: Introduction: Integrated Solid-Waste Management Topic 2: Waste Quantities and Characteristics Topic 3: Source of Solid Waste Topic 4: Quantities and Composition Topic 5: Physical, Chemical and Biological Characteristics</p> <p>Assessments: Quiz 1</p> |
| Module 2 | <p>Topics: Topic 6: Storage and Collection Topic 7: Pneumatic-Refuse-Collection System Topic 8: Transfer and Transport Topic 9: Materials Recovery and Recycling Topic 10: Segregating; Reuse and Recycle</p> <p>Assessments: Quiz 2 Project 1</p> |
| Module 3 | <p>Topics: Topic 11: Disposal Topic 12: Landfill Topic 13: Co-Processing of Solid Wastes Topic 14: Combustion and Energy Recovery Topic 15: Biomedical Waste</p> <p>Assessments: Midterm</p> |
| Module 4 | <p>Topics: Topic 16: Hazardous Waste Topic 17: Waste From Electrical and Electronic Equipment Topic 18: Wastes From Industrial and Commercial Activities Topic 19: Radio Active Waste Topic 20: Health and Safety Issues</p> <p>Assessments: Project 2</p> |
| Module 5 | <p>Topics: Topic 21: Environmental Issues Topic 22: Impact on Air, Water and Soil; Impact on Flora and Faun Topic 23: Greenhouse Gas Generation and Climate Change Topic 24: Issues in Disaster Affected Area Topic 25: Solid Waste and Livelihood</p> <p>Assessments: Research Paper Final Exam</p> |



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).



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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.

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.