Winter 2026 | Course outline

CIV E 628: Municipal Solid Waste Management

University of Alberta, Faculty of Engineering

Department of Civil and Environmental Engineering

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This course will be offered in in-person mode. So, no lectures will be recorded and posted on eCanvas. A designate may cover a portion of the course materials (another instructor) or by a guest lecturer.

Office Hours: Please contact me via email to arrange 10-30 minutes online meeting via Google Meet. Please include "CIVE 628 Meeting Request" in the title line.

Lecture Schedule: Tuesday 11:00 - 13:50 (Mountain Standard Time/Edmonton local time), Location: NRE 2-080

Course Description

Principles of municipal waste management to protect public health, municipal waste streams, waste stream analysis and prediction. Refuse collection, storage and hauling methods, and facilities. Engineering design and operation of solid waste processing, treatment and disposal methods: resource recovery, recycling programs, incineration, composting, landfilling, and novel techniques. Solid waste legislation and policies. Environment impacts, impact management and facility siting of waste facilities.

Course Outline

Module 1: Introduction to solid waste management

Module 2: Solid Waste characteristics

Module 3: Solid waste collection

Module 4: Material recovery facility (MRF)

Module 5: Composting

Module 6: Anaerobic digestion

Module 7: Thermochemical conversion processes

Module 8: Landfill Engineering

Learning Objectives

By the end of this course students will be able to:

- Define and explain advanced fundamental and engineering concepts of waste management and treatment concerning composition, properties, treatment or transformation processes.
- Prepare preliminary engineering design calculations related to waste treatment facilities.
- Identify relevant legislation and regulations, future trends in waste management industry, and resource recovery options from various waste streams.
- Make an oral presentation related to waste management and treatment practices, and critically analyze in a written report.

Reference Materials

Lecture covering each part of the course content will be available to download from the eClass. This course will be mainly based on the course lectures. For references, the following textbooks are recommended:

- Tchobanoglous, George, Hilary Theisen, and Samuel Vigil. Integrated solid waste management: engineering principles and management issues. McGraw-Hill, Inc., 1993.
- H.D. Sharma and K.R. Reddy. Geoenvironmental Engineering: Site Remediation, Waste Containment and Emerging Waste Management Technologies. John Wiley & Sons ISBN: 0- 471-21599-6, 2004.
- George, Tchobanoglous, and Kreith Frank. Handbook of solid waste management. McGraw-Hill, Inc., 2002.
- Metcalf & Eddy, Franklin L. Burton, H. David Stensel, and George Tchobanoglous. Wastewater engineering: treatment and reuse. McGraw Hill, 2003.

Learning Modes

Lectures, guest lectures, term projects

Assignments

Four (4) home assignments will be scheduled during the term. The deadline for each assignment will be posted on eClass. A late submission of the assignment will be penalized 33% per day. However, the student may contact the instructor for an extension. **No extensions will be given, except in the event of illness or other overwhelming factors.** Workload and other commitments outside of this class are not a valid reason for extensions of due dates.

Term Project (Class Presentation)

Students are required to do an individual/group (depending on the class size) class presentation. Detailed information including potential topics for the project will be provided during the lecture.

Presentation Schedule: TBD

Mid-term and final exam

All exams will be CLOSED book (Format: 30-35% theoretical/conceptual question + 65-70% calculation). Only approved non-programmable calculators are permitted. For further information on the Faculty of Engineering Calculator Policy, please visit.

www.engineering.ualberta.ca/students/calculators.asp

Mid-term Exam:

Syllabus: Modules 1-3

February 24, 2025

Final Exam:

Syllabus: Modules 4-8

April 7, 2025

Evaluation

All letter grades will be assigned according to the criteria specified in the University of Alberta Marking and Grading Guidelines. At the end of the course, final grades will be assigned with periodic homework assignments, term project, quiz, and exams. Scores will be weighted to compute final grades as listed below:

- 20% Assignments (4 assignments)
- 30% Mid-term exam
- 40% Final exam
- 10% Term Presentation

Academic integrity

Please review the Code of Student Behaviour paying particular attention to the section on "Plagiarism and Cheating." Remember, depending on the severity of the infringement penalties range from lowering grades to expulsion. The Code of Student Behaviour can be found at http://www.uofaweb.ualberta.ca/secretariat/studentappeals.cfmon or in Appendix A of the General Calendar.

Attendance

"Since presence at lectures, participation in classroom discussions and projects, and the completion of assignments are important components of most courses, students will serve their interests best by regular attendance. Those who choose not to attend must assume whatever risks are involved" (UofA Calendar §23.3 Attendance).

Expectations for AI use

In this course, our primary focus is to cultivate an equitable, inclusive, and accessible learning community that emphasizes individual critical, creative, and affective thinking as well as disciplinary problem-solving skills. While it is reasonable to assume AI-use might accelerate some aspects of coursework, the determination has been made to not use such tools. In order to achieve the identified course learning outcomes, students must be given learning opportunities and tasks

which enable students to develop and demonstrate their skills and knowledge across course and discipline specific projects, assignments, and assessments.

To ensure a just and consistent learning experience for all students, the use of advanced AI-tools such as ChatGPT or Dall-E 2 is strictly prohibited for all academic (written/coding/creative/etc.) work, assignments, and assessments in this course. Each student is expected to complete all tasks without substantive assistance from others, including AI-tools.

IMPORTANT: Please note that AI use is strictly prohibited in course work, assignments, and assessments. Failure to abide by this guideline may be considered an act of cheating and a violation as outlined in the relevant sections of University of Alberta (November 2022) Code of Student Behaviour.

Disclaimer

Any typographical errors in course materials are subject to change and will be announced in class.