College of Engineering Department of Civil Engineering



CE 546 Solid Waste Management Credit and 3 / 3 (Lectures), 0 (Tutorials), 0 (Laboratory) **Contact hours Required**, or Required Elective The course focuses on the study of engineering and management principles, practices, and techniques for the management and disposal of solid wastes. Topics Course include characteristics, generation, transport, processing, resource recovery, **Description** disposal, landfill design and operation, leachate management, and contaminant transport. **Prerequisites** or Co-None requisites Students completing this course successfully will be able to: **Related Student Course Learning Outcomes (CLOs)** Outcomes (SO) CLO1. Identify the solid waste demands that must be met by engineers and the **SO1** impacts of legislation on engineering and scientific activity in solid waste management. K1 CLO2. Identify sources, types, and composition of solid waste, in addition to the physical, chemical, and biological properties and transformations of waste **SO1** materials. K1 Course CLO3. Recognize the processing of MSW such as sorting and compaction, **SO1** transportation and final processing. K1 Learning CLO4. Determine quantities of waste materials that can be recovered from MSW **Outcomes SO2** for effective separation and processing of solid waste components. S1 CLO5. Develop design strategies depending on the solid waste composition to **SO2** transform solid waste using thermal, biological, and chemical conversion technologies. S1 CLO6. Develop closure plans and guidelines for the long-term care (operational and maintenance of closed landfills) in real-life projects. In addition to studying **SO5** the Impact of inactive landfills and determining the need for remediation. S4 CLO7. Demonstrate professional engineering and ethical values in assigned **SO6** projects, assignments, and research work with high academic integrity. V1 SO 1 Recognize advanced engineering knowledge, concepts, and techniques to identify, interpret, and analyze complex and real-life engineering problems. Student SO 2 Provide solutions for complex and real-life engineering problems through critical thinking **Outcomes** and the use of modern engineering tools, and identify their impact on social, global, cultural, related to this environmental, safety, and economic factors. SO 5 Design novel advanced Civil Engineering systems and evaluate their performance, Course sustainability, and effectiveness for engineering practice and their impact in global,

economic, environmental, and societal contexts

	SO 6 Demonstrate scientific integrity, ethical responsibility, and academic va publications, research projects, and thesis work.	llues in scientific
	List of Topics	Related CLOs
Topics Covered	1. Introduction and evolution of solid waste management	CLO 1,2,3
	2. Sources, composition, and properties	CLO 2
	3. Solid waste generation rates	CLO 2,3
	4. Waste handling, separation, storage, and processing at the source	CLO 3
	5. Collection of solid waste and source-separated materials	CLO 3,4
	6. Separation processes, and transformation of waste materials	CLO 4
	7. Waste/transfer and transport	CLO 3,5,7
	8. Disposal of solid wastes and residual matter	CLO 5,6,7
	9. Closure of landfills	CLO 6,7
	10. Remedial actions for abandoned waste disposal sites	CLO 6,7
	11. Recycling of waste materials	CLO 3,7
Textbook(s)	• Tchobanoglous G., Theisen H., Vigil S. A. " Integrated Solid Waste	
and Other	Management: Engineering Principles and Management Issues,	McGraw-Hill
Required	(1993).	
Material	• Vesilind P. A. and Worrell W. A. "Solid Waste Engineering" (2015)	
Grading System	Assignments 20%	
	Research work 20%	
	Mid-term exams 20%	
	Final Exam40%	
Instructors	Prof. Anwar Khursheed / Dr. Faris M Munshi / Dr. Abdulaziz I Almohanna	
Date of Review	November, 2024	