



## Course Descriptor

### ENEN461 SOLID WASTE MANAGEMENT

Proposed Academic Year	2020-2021	Last Reviewed Academic Year	Fall 2020
Course Code	ENEN461	Course Title	Solid Waste Management
Credit hours	3	Level of study	4 <sup>th</sup> Year
College / Centre	COE	Department	Civil and Environmental
Co-requisites	None	Pre-requisites	None

#### 1. COURSE OUTLINE

Nature and environmental effects of solid wastes and sludge including hazardous wastes. Engineering management principles, practices, and techniques for management of solid and sludge wastes. Solid waste generation, storage, collection and transport processing, resource recovery, and disposal. Administration of solid waste management and health and safety considerations. Trip to local facility.

#### 2. AIMS

[To provide detailed knowledge and skills in the management, treatment, disposal and recycling options for solid wastes and the role resource efficiency plays in conserving resources and contributing to a low carbon economy, while focusing on key engineering and technical aspects involved. Understanding of the basic principles of waste and resource management will be supplemented, where appropriate, by practical problem-solving exercises in the context of civil engineering

#### 3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS

Learning Outcomes (Definitive)	Teaching and Learning methods (Indicative)	Assessment (Indicative)
Upon successful completion of this course, students will be able to:		
1. Understand and apply the basic scientific and sustainability principles behind waste management, for solving practical waste management challenges. Understand the role legislation and policy drivers play in stakeholders' response to the waste and resource management challenge.	Lectures	Assignments and in-class tests
2. Understand the fundamental principles of existing and emerging technologies for the treatment of waste and recovery of value from waste.	Lectures & Field visit	Assignments and in-class tests
3. Appreciate the role of	Lectures	Assignments and in-class tests



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<p>decision-making tools in the critical assessment of major waste issues. Appreciate the increasing importance of waste and resource management in achieving environmental sustainability.</p>		
<p>4. Demonstrate their ability to research and present on a topic on a significant waste challenge. Transfer their knowledge and skills and contribute to "best practice" within the stakeholder environment.</p>	Lectures	Assignments and in-class tests

#### 4. ASSESSMENT WEIGHTING

Assessment	Percentage of final mark (%)
Assignments	20%
Mid-term Examination 1	20%
Mid-term Examination 2	20%
Final Examination	40%
<b>TOTAL</b>	<b>100%</b>

#### 5. ACHIEVING A PASS

Students will achieve **3** credit hours for this course by passing **ALL** of the course assessments and achieving a **minimum overall score of 50%**

**NB \*Ensure that ALL learning outcomes are taken into account**

#### 6. COURSE CONTENT (Indicative)

Definition of waste and its classification	
Sources, Composition, and Properties of Solid Waste	
Physical, Chemical and Biological Properties of MSW	
Solid Waste Generation and Collection	
Waste Handling and Separation, Storage and Processing at the Source	
Transfer and Transport	
Separation and Processing and Transformation of Solid Waste	
Advances in waste recycling and recovery technologies to deliver added-value products	
Health considerations in the context of operation of facilities, handling of materials and impact of outputs on the environment	
Disposal of Solid Wastes and Residual Matter	
Landfill engineering and the management of landfill leachate	
Landfill Gas Collection System and Leachate Recirculation System Design	
<b>TOTAL HOURS</b>	<b>45</b>



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6. COURSE CONTENT (Indicative)	
Plus RECOMMENDED INDEPENDENT STUDY HOURS	90
<b>TOTAL COURSE HOURS</b>	<b>135</b>

## 7. RECOMMENDED READING

### Core text/s:

Tchobanoglous, G., Theisen H., and Virgil, S. (1993). *Integrated Solid Waste Management*, McGraw-Hill Publishers, Inc., New York, NY.

Tchobanoglous, G. and Kreith, F. (2002). *Handbook of Solid Waste Management*, 2nd Ed, McGraw-Hill Publishers, Inc., New York, NY.

### Library + online resources:

[Various resources](#)