



UNIVERSITI TEKNOLOGI MARA

EVT732: WASTE TREATMENT AND TECHNOLOGY

Course Name (English)	WASTE TREATMENT AND TECHNOLOGY APPROVED
Course Code	EVT732
MQF Credit	3
Course Description	The course is intended to provide an in-depth knowledge of solid waste management with a focus on management systems and treatment methods related to environmental policies which will enable them to critically evaluate and select the best available green technology and practices leading towards sustainable development. The course is intended to provide an in-depth knowledge of solid waste management with a focus on management systems and treatment methods related to environmental policies. Moreover, principles of solid waste management, methods for waste treatment, recycling methods, environmental economics, and sustainable production will also be considered. Lecture sessions employ a mixture of lectures and active learning (self and peer discussions). The outcomes shall be assessed through a variety of tools which include the traditional paper examination, tests, a mini project, a written assignment and oral presentation.
Transferable Skills	Students are able to assess suitable technology for waste treatment and disposal.
Teaching Methodologies	Lectures, Case Study
CLO	CLO1 Interpret the various types of current technologies and advanced method which are important aspects of waste treatment and disposal CLO2 Apply national laws and legislation concerning solid waste issues, which directly impact various treatment technologies CLO3 Analyze the application of waste treatment technologies based on the characteristic of the waste CLO4 Conclude the advantages and limitations of various advanced waste treatment and technologies or methods
Pre-Requisite Courses	No course recommendations
Topics	
1. Course overview and objectives 1.1) 1.1. Waste classification 1.2) 1.2. Types of urban waste 1.3) 1.3. Regulatory framework for solid waste management	
2. Solid waste management 2.1) 2.1. Source, types and composition of municipal solid 2.2) Waste 2.3) 2.4) 2.2. Quantity and quality of solid waste 2.5) 2.2.1 Physical properties 2.6) 2.2.2 Chemical properties 2.7) 2.2.3 Biological properties 2.8) 2.9) 2.3. Solid waste generation and collection rates 2.10) 2.11) 2.3.1. Measures and methods used to assess solid waste quantities 2.12) 2.3.2. Solid waste generation and collection rates	

3. Transformation and Recycling of Waste

- 3.1) Recycling of Waste
- 3.2) 3.2 Landfill
- 3.3) 3.2.1. Processes operating the waste landfills
- 3.4) 3.2.5. Energy recovery from landfill gases
- 3.5)
- 3.6) 3.3. Biological and chemical technologies
- 3.7) 3.3.1. Aerobic composting
- 3.8) 3.3.2. Anaerobic digestion
- 3.9) 3.3.3. Chemical transformation processes
- 3.10) 3.3.4. Energy production from biological conversion
- 3.11)
- 3.12) 3.4. Thermal conversion technologies
- 3.13) 3.4.1. Incineration
- 3.14) 3.4.2. Pyrolysis
- 3.15) 3.4.3. Gasification

4. Industrial Waste

- 4.1) 4.1 Biodegradable wastes
- 4.2) 4.1.1. Recycling industrial wastes
- 4.3) 4.1.2. Clean technology
- 4.4) 4.1.3. Tannery waste
- 4.5) 4.1.4. Food and agriculture industries wastes
- 4.6)
- 4.7) 4.2. Non biodegradable waste
- 4.8) 4.2.1. Petroleum refineries
- 4.9) 4.2.2. Steel plants
- 4.10) 4.2.3. Latex glove industry
- 4.11) 4.2.4. Construction industry
- 4.12)
- 4.13) 4.3. Industrial waste minimization
- 4.14) 4.3.1. Case studies

5. Medical Waste

- 5.1) 5.1. Clinical waste handling
- 5.2) 5.2. Incineration of clinical waste
- 5.3) 5.3. Waste minimization options

6. Treatment and Utilization Practise for Recycle of Sewage Sludge

- 6.1) 6.1. Characteristic of sewage sludge
- 6.2) 6.2. Sewage sludge treatment processes
- 6.3) 6.3. Utilization of treated sewage sludge

7. Radioactive Waste Management

- 7.1) 7.1. Radioactive and regulatory control
- 7.2) 7.2. Waste collection and storage
- 7.3) 7.3. Site selection for raw repository
- 7.4) 7.4. Waste classification and repository
- 7.5) 7.5. Waste storage and repository

8. Industrial Talk

- 8.1) Speakers from the related industry will be invited to give a talk on waste technology issues.

Assessment Breakdown	%
Continuous Assessment	70.00%
Final Assessment	30.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	1 assignment	15%	CLO3
	Assignment	1 assignments	15%	CLO4
	Test	1 test throughout semester	40%	CLO2

Reading List	Recommended Text	<ul style="list-style-type: none"> Williams, P. T 2005, <i>Waste Treatment and Disposal.</i>, 2nd ed. Ed., John Wiley & Sons, LTD West Sussex
	Reference Book Resources	<ul style="list-style-type: none"> Agamuthu, P. 2001, <i>Solid Waste: Principles and Management: with Malaysian case studies.</i>, Institute of Biological Sciences, University of Malay Kuala Lumpur Tchobanoglous, G., Theisen, H., Vigil, S.A 1993, <i>Intergrated Solid Waste Management.</i>, McGraw-Hill, Inc New York
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	