

<b>Semester:</b>	4		
<b>Course Code:</b>	ENCM 22773		
<b>Course Name:</b>	Solid and Hazardous Waste Management		
<b>Credit Value:</b>	03		
<b>Status:</b>	Compulsory		
<b>Pre-requisite:</b>	ENCM 12742		
<b>Co-requisite:</b>	None		
<b>Hourly Breakdown:</b>	Theory	Practical	Independent Learning
	40	15	95
<b>Intended Learning Outcomes:</b>			
<p>After completion of this course unit, the student will be able to;</p> <ol style="list-style-type: none"> <li>1. explain the characteristics/properties of solid and different types of hazardous waste,</li> <li>2. discuss the environmental, social and economic issues related to solid and hazardous waste,</li> <li>3. discuss and explore effective material recovery strategies,</li> <li>4. discuss the applicability of sustainable waste management techniques, and</li> <li>5. develop basic management plans for handling domestic, municipal, and industrial solid and hazardous waste.</li> </ol>			
<b>Course Content:</b>			
<p>Solid and Hazardous Waste: definition, types and classification, sources, typical quantities generated; Composition/properties of solid and hazardous wastes, characterization of wastes; Environmental impacts of solid and hazardous waste; Organizations involved in waste management in Sri Lanka; Solid waste management: Storage, collection and transportation, treatment and disposal; waste management hierarchy; waste minimization; waste processing and material recovery strategies: reuse and recycling of solid wastes (R concepts); waste processing and material recovery strategies: upcycling, co-processing; waste audit; Physico-chemical and biological treatment strategies; Thermal methods; Solid and Hazardous waste disposal- sanitary landfills, secure landfills: site selection, liners, landfill stability, closure and post closure care, monitoring methods; Landfill leachate and gas management, fly ash generation and management; Surface impoundments, deep well injection for hazardous waste disposal; Integrated waste management; Workplace management of hazardous materials and hazardous waste; Biomedical waste management; Bioplastic, e-waste and radioactive waste management; Policies and legislations and guidelines in Sri Lankan for the management of solid and hazardous waste, scrap tires, lead acid batteries; Recent developments and applications of biotechnology in waste management.</p> <p>Field study at a sanitary landfill site, an open dumping site and an incineration plant.</p>			
<b>Teaching /Learning Methods:</b>			
A combination of lectures, field studies, computer based learning, self-studies, field based assignments and small group discussions.			

<b>Assessment Strategy:</b> Continuous assessment and end of semester examination. Percentage given for each sub-component indicates the percent contribution to the final marks.			
Continuous Assessment 30 %		Final Assessment 70 %	
Details:		Theory	Practical
Quizzes	10	70	-
Assignments	10		
Practical reports	10		
<b>Recommended Readings:</b>			
<ol style="list-style-type: none"> <li>1. Tchobanoglous, G &amp; Kreith, G (2002) Handbook of Solid Waste Management. 2<sup>nd</sup> Edition. McGraw-Hill.</li> <li>2. Chandrappa, R. &amp; D.B. Das (2012). Solid Waste Management: Principles and Practice. Springer, Verlag Berlin Heidelberg.</li> <li>3. Bagchi, A. (2004). Design of Landfills and Integrated Solid Waste Management. 3<sup>rd</sup> Edition. Willey.</li> <li>4. Blackman, W.C. (2001). Basic Hazardous Waste Management. 3<sup>rd</sup> Edition CRC Press.</li> <li>5. LaGrega, M. D., P. L. Buckingham &amp; J. C. Evans (2010). Hazardous Waste Management. Reissue edition, Waveland Press, INC.</li> <li>6. <a href="http://www.cea.lk">www.cea.lk</a>- publications</li> </ol>			