

Liverpool John Moores University

Title: Control of Industrial Waste and Pollution
Status: Definitive
Code: **6508ENGSBC** (119419)
Version Start Date: 01-08-2016

Owning School/Faculty: Maritime and Mechanical Engineering
Teaching School/Faculty: The Sino-British College

Team	Leader
Russell English	Y

Academic Level: FHEQ6
Credit Value: 12
Total Delivered Hours: 37
Total Learning Hours: 120
Private Study: 83

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	20
Tutorial	15

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	investigat	Investigation of material production cycles and disposal options	30	
Exam	exam		70	2

Aims

The aim of this module is to give students an understanding of the complex issue of pollution. It will consider the causes and how the engineer can help to provide remedies to the problem

Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate an understanding of the principles underpinning industrial waste treatment and be able to specify and design waste treatment plant for specific applications
- 2 Appraise and select manufacturing materials and processes in order to reduce pollution and/or increase re-cycling.
- 3 Discuss the need for clean rooms in certain manufacturing processes and design ventilation and filtration systems for nuclear, chemical and biological applications
- 4 Discuss sources and handling of hazardous waste

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

cycles and options	4	2
2 hours; 3 from 5 questions	1	3

Outline Syllabus

Particle sizes of various pollutants. General principles of filtration, absorption and settling. Basic calculation of filter/absorption efficiencies and settling times. Select and size filtration and scrubbing. Industrial Effluent Treatment; Exhaust-scrubbing and CO₂ capture.

Principle of differential air pressurization to prevent egress and/or ingress of gases or particles. Basic design calculations and basic design layouts of ventilation and filtration plant including laminar air-flow design.

Follow complete production cycle (from raw material to disposal) of various materials used in manufacturing (cars for example) to assess their environmental impact. Identify alternative materials.

Follow nuclear fuel cycle for sources of high-level radioactive waste, and the reasons why certain disposal options are required. Follow production cycles and disposal of innocuous materials to identify potential source of toxins.

Explanation of the fundamentals of the physiochemical or biochemical processes and their interaction with particulate contaminates

Learning Activities

Delivered with a range of lectures, tutorials, and case studies.

Notes

This module will be delivered with the aid of case studies and investigative approach to study will be encouraged.