

**City University of Hong Kong
Course Syllabus**

**offered by
Department of Biomedical Engineering /
Department of Mechanical Engineering
with effect from Semester A 2018 / 19**

Part I Course Overview

Course Title:	Green Industrial Systems
Course Code:	MBE4046
Course Duration:	1 semester
Credit Units:	3 credits
Level:	B4
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: <i>(Course Code and Title)</i>	Students must complete a minimum of 45 CUs to be eligible
Precursors: <i>(Course Code and Title)</i>	Nil
Equivalent Courses: <i>(Course Code and Title)</i>	SEEM4046/JC4046 Green Industrial Systems
Exclusive Courses: <i>(Course Code and Title)</i>	Nil

Part II Course Details

1. Abstract

(A 150-word description about the course)

The course covers a broad appreciation of the responsibility, obligation and practices on environmental issues in an industrial organization. The objective is to provide an overview of various techniques, skills and strategies for environmental conscious industry.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Discuss and argue the impacts of industrial pollution on ecosystem and human health.		✓		
2.	Familiarize with local and international industrial pollution regulations and policies.			✓	
3.	Develop, implement and audit an environmental management system according to the international standard ISO14000.			✓	✓
4.	Apply the principles and practices of design for environment in consumer products to reduce their total environmental impact.			✓	✓
5.	Quantify environmental impact of industrial processes with different types of environmental performance indices.			✓	
6.	Explain the processes and techniques of environmental impact assessment and monitoring in relation to industries-and green product design.			✓	
		N.A.			

* If weighting is assigned to CILOs, they should add up to 100%.

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4	5	6	
Lecture	Learning through teaching is primarily based on lectures. Emphasis in lectures is placed on the understanding of environmental management principles and their practical applications in various green industrial systems.	✓	✓	✓	✓	✓	✓	3 hrs/week
Problem Solving Project	Exercises/projects are given to students to <ul style="list-style-type: none"> learn the compilation of environmental management system documentations and its audits through industrial cases / projects. explore and identify problems and the design of consumer products in view of design for environment. 	✓	✓	✓	✓	✓		
Presentations and Essay	Explain the processes and techniques of environmental impact assessment and monitoring in relation to industries and green product design.						✓	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.						Weighting*	Remarks
	1	2	3	4	5	6		
Continuous Assessment: 40%								
Problem Solving Project	✓	✓	✓	✓	✓		20%	
Presentations and Essay						✓	20%	2-3 presentations and one essay
Examination: 60% (duration: 2 hours)								
							100%	

* The weightings should add up to 100%.

For a student to pass the course, at least 30% of the maximum mark for both coursework and examination should be obtained.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Problem Solving Project	Ability to explain in detail and with accuracy methods of inquiry useful in analysing for the design of high-value-added, user-friendly and eco-friendly products.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Presentations and Essay	Capacity for self-directed learning to understand the principles of green industrial systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Examination	3.1 Ability to explain in detail the implementation & audit of an environmental management system. 3.2 Ability to apply the principles of design for environment in consumer products. 3.3 Capacity for applying accuracy measures of environmental impact assessment for an industrial project.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

- Industrial pollution and ecosystem.
- Sustainable Engineering.
- Environmental regulations.
- ISO14000 environmental management system and audit.
- Environmental performance indices.
- Green Product Design.
- Life cycle assessment.
- Environmental impact assessment.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Graedel T. E. and Allenby B.R., Industrial Ecology and Sustainable Engineering, Pearson, 2010.
2.	Graedel T. E. and Allenby B.R., Industrial Ecology (Second Edition), Prentice Hall, 2003.
3.	Myer K., Environmentally Conscious Manufacturing, Wiley, 2007.
4.	Ritchie, I. and Hayes, W., A guide to the implementation of the ISO 14000 series on environmental management, Upper Saddle River, N.J.: Prentice Hall, 1998.
5.	Fiksel, J. (Ed.), Design for environment: creating eco-efficient products and processes, New York: McGraw-Hill, 1996.
6.	ISO14000 Environmental Management Series, International Organization for Standardization (ISO).
7.	Technical Memorandum on Environmental Impact Assessment Process, Hong Kong Environmental Protection Department.

Online Resources

Course Website available on the Canvas throughout the semester.

Websites of the Environmental Protection Department of the SAR, and companies adopting green industrial practices.