Form 2B

City University of Hong Kong

Information on a Course
offered by Department of Mechanical and Biomedical Engineering
with effect from Semester B 2011/2012

Part I

Course Title: **Sustainable Green Manufacturing**

Course Code: **MBE6051**

Course Duration: **One Semester**

No. of Credit Units: **3**

Level: **P6**

Medium of Instruction: **English**

Prerequisites: **Nil**

Precursors: **Nil**

Equivalent Courses: **MEEM6051 Sustainable Green Manufacturing**

Exclusive Courses: **Nil**

Note: Students may repeat a course, or an equivalent course, to improve course grade only if the previous course grade obtained is C or below.

Part II

1. Course Aims:

The course aims to introduce and explain the design concepts, methods, tools and some technologies, and operations of sustainable lean and green manufacturing systems and processes. It also covers the assessment, audit, design and maintenance of sustainable green manufacturing products, processes, service systems, and leads towards the entire greening process of multi-lifecycle manufacturing operations, factories and their supply chains.

2. Course Intended Learning Outcomes (CILOs)

Upon successful completion of this course, students should be able to:

No.	CILOs	Weighting* (if applicable)
1	**Explain** the design concepts, methods, tools, the key technologies and the operation of sustainable green manufacturing	1
2	**Apply** the principles, techniques and methods to customize the learned generic concepts to meet the needs of a particular industry/enterprise	2
3	**Identify** the strategies for the purpose of satisfying a set of given sustainable green manufacturing requirements	3
4	**Design** the rules and processes to meet the market need and the green manufacturing requirements by selecting and evaluating suitable technical, managerial / project management and supply chain management schemes	4

***Weighting ranging from 1,2,3 to indicate the relative level of importance in an ascending order.**

3. Teaching and learning Activities (TLAs)

(Indicative of likely activities and tasks designed to facilitate students' achievement of the CILOs. Final details will be provided to students in their first week of attendance in this course)

Activity Type	Timetabled Activity (Hours per week)
Lecture/Tutorial Mix	Lecture mixed with tutorial (3)

CILO No.	Large class Activities	Group work Activities	Individual work Activities	Total Hours
	Lecture	Tutorial	(Self study)	L+T (+S)
CILO 1	3	1.5	(2.5)	4.5 (+ 2.5)
CILO 2	5	2.5	(4.5)	7.5 (+4.5)
CILO 3	8	4	(6)	12 (+ 6)
CILO 4	10	5	(7)	15 (+7)
Total	26	13	(20)	**39** (+20)

Large class activities:

Lectures on the topics of the keyword syllabus

Group work activities
Group projects are given to students for the investigation in relation to the CILOs. Students will discuss the projects during the tutorial period. The group assessment is based on the group presentation and the group report.
Individual work activities
Students are required to carry out self study on webs and search appropriate technical and managerial information/data in conjunction with the lecturing materials to accomplish a set of given requirements. The work of the self study will be presented as an individual report for assessment.

4. Assessment Tasks/Activities

(Indicative of likely activities and tasks designed to assess how well the students achieve the CILOs. Final details will be provided to students in their first week of attendance in this course)

ILOs \ Assessment Tasks	Group presentation & report	Individual report	Examination (2 hours)	Total (%)
CILO 1	2	2	7	11
CILO 2	3	3	10	16
CILO 3	7.5	7.5	15	30
CILO 4	12.5	12.5	18	43
Total (%)	25	25	50	100

Group presentation & report: 25% Marks
10% of the marks is based on the presentation and 15% is based on the report.

Individual report: 25% Marks
20% of the marks is based on the accomplishment of satisfying the given requirements and 5% is based on the self study of webs.

Examination: 50% Marks
2 hours.

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

5. Grading of Student Achievement:

To reflect the ILOs listed above, the coursework and the final exam will be designed in ways which require the students to demonstrate their understanding of each topic and to solve a specific problem by applying their knowledge in an integrative manner. Grading will be based on the students' ability to demonstrate their skills convincingly.

Grade Table

Letter Grade	Grade Point	Grade Definitions
A+	4.3	Excellent
A	4.0	
A-	3.7	

B+ B B-	3.3 3.0 2.7	Good
C+ C C-	2.3 2.0 1.7	Adequate
D	1.0	Marginal
F	0.0	Failure
P	-	Pass

Please refer to the SGS's website for details.

Part III

Keyword Syllabus:

Introduction to lean sustainable green manufacturing. The 18 monozukuri principles with USA, European, Japanese and Hong Kong examples. Analytical methods and computational assessment and design tools for evaluating and designing green manufacturing sustainability processes, requirements, and risks. The sustainable lean and green audit process. International green manufacturing standards and compliance. Green rapid prototyping and rapid manufacturing. Green flexible automation. Green collaboration processes via the Internet. Alternative energy resources. Globally green manufacturing supply chains and logistic networks. Sustainable green manufacturing system design and project management. International industrial and research case studies from the USA, Europe, Japan, Hong Kong, China and elsewhere.

Recommended Reading:
Text(s):

1. Edited by: Charles Wankel "21st century management : a reference handbook" SAGE Publications, Inc., 2008.

2. Edited by: Christian N. Madu "Handbook of environmentally conscious manufacturing" London : Kluwer Academic Publishers, 2001.

3. T.E. Graedel & B.R. Allenby "Industrial Ecology" Pearson Education, Inc. 2003.

4. Edited by: Joseph Sarkis "Greener manufacturing and operations: from design to delivery and back' Greenleaf Pub., 2001.

5. Ranky, P.G.: An Introduction to Alternative Energy Sources: An interactive multimedia 3D eBook publication by CIMware USA, Inc. and CIMware Ltd., UK, ISBN 1-872631-97-5, 2008

6. Ranky, P.G.: Digital Product Design: Design For Quality, Manufacturing, Assembly & Disassembly Principles, and an Inkjet Printer Disassembly Use Case, DVD video publication by CIMware USA, Inc. and CIMware Ltd., UK, 2008, UPC 632568002983

7. Ranky, P.G.: Digital Product Design: Concurrent Engineering Principles, Analysis and Some Tools of Design For Quality, Manufacturing, Assembly & Disassembly, and a Desktop Telephone Disassembly Use Case, DVD duo video and 3D eBook publication by CIMware USA, Inc. and CIMware Ltd., UK, 2008, UPC 632568003034