

City University of Hong Kong
Course Syllabus

offered by Department of Systems Engineering & Engineering Management
with effect from Semester A 2017 / 18

Part I Course Overview

Course Title:	<u>Advanced Design of Experiments and Taguchi Method</u>
Course Code:	<u>SEEM8103</u>
Course Duration:	<u>One Semester</u>
Credit Units:	<u>3</u>
Level:	<u>R8</u>
Proposed Area: (for GE courses only)	<input type="checkbox"/> Arts and Humanities <input type="checkbox"/> Study of Societies, Social and Business Organisations <input type="checkbox"/> Science and Technology
Medium of Instruction:	<u>English</u>
Medium of Assessment:	<u>English</u>
Prerequisites: (Course Code and Title)	<u>Nil</u>
Precursors: (Course Code and Title)	<u>Basic Probability and Statistics</u>
Equivalent Courses: (Course Code and Title)	<u>Nil</u>
Exclusive Courses: (Course Code and Title)	<u>Nil</u>

Part II Course Details

1. Abstract

This course aims to further develop students' understanding and application of the theories and methods of statistical modelling of observational data and design of experiment. Contents covered include linear models, regression models, and analysis of variance models.

2. Course Intended Learning Outcomes (CILOs)

No.	CILOs [#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Understand the statistical hypothesis testing	10%	✓		
2.	Explain the needs for design of experiments in manufacturing and other applications	15%	✓	✓	
3.	Apply design and analysis of experiments methods to characterize and improve systems and processes	25%		✓	
4.	Explain robust design, Taguchi method etc	25%		✓	
5.	Apply DOE and Taguchi Method to real life problems	25%		✓	
		100%			

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

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)

TLA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4	5	
Lecture & Tutorial	- large class activity - questions and discussion	✓	✓	✓	✓	✓	39 hours/sem (in-class) 66 hours/sem (ex-class)

4. Assessment Tasks/Activities (ATs)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: <u>100</u> %							
Group Project		✓	✓	✓	✓	40%	
Individual Coursework	✓		✓	✓		25%	
Mid Term Test		✓	✓	✓		35%	
Examination: <u>0</u> % (duration: , if applicable)							
* The weightings should add up to 100%.						100%	

5. Assessment Rubrics

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Group Project	Application of class materials and teamwork	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Individual Coursework	Understanding of class materials					
3. Mid Term Test	Understanding of class materials					

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

1. Keyword Syllabus

- Data collection, data analysis, and model prediction
- Design and analysis of Experiments
- Analysis of Variance modelling
- Full factorial and fractional factorial designs
- Process characterization and improvement
- Robust design and parameter design
- Taguchi Method

2. Reading List

2.1 Compulsory Readings

1.	<i>Applied Linear Statistical Models</i> by Kutner, Nachtsheim, Neter, and Li, 5th edition, McGraw Hill, 2005.
2.	Lecture notes

2.2 Additional Readings

NIL