

**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: Statistical Modeling and Design of Experiments

Course Code: SEEM8011

Course Duration: One Semester

Credit Units: 3

Level: R8

Arts and Humanities

Proposed Area:
(for GE courses only)

Study of Societies, Social and Business Organisations

Science and Technology

Medium of Instruction: English

Medium of Assessment: English

Prerequisites:
(Course Code and Title) Nil

Precursors:
(Course Code and Title) Knowledge in Basic Probability and Statistics

Equivalent Courses:
(Course Code and Title) MEEM8011/MEEM8011D/SEEM8011D
Statistical Modeling and Design of Experiments

Exclusive Courses:
(Course Code and Title) Nil

Part II Course Details

1. Abstract

This course aims to develop students' abilities to understand the theory and application methods on statistical modeling of observational data and design of experiment data, including 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.	Develop a familiarity with basic statistical estimation and hypothesis testing ideas and methods	10%	✓	✓	
2.	Understand simple and multiple linear regression models and corresponding inference methods for process characterization and prediction.	30%	✓		
3.	Understand motivations and needs for design of experiments in manufacturing and other applications.	10%	✓		
4.	Understand design and analysis of experiments methods to characterize and improve systems and processes.	30%	✓		
5.	Understand and apply regression methods and design of experiment methods to analyze and solve real life problems and applications.	20%	✓		
		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	-large class activity -questions and discussion	✓	✓	✓	✓	✓	39 hours/sem

4. Assessment Tasks/Activities (ATs)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: <u>100</u> %							
Group Work		✓	✓	✓	✓	40%	
Individual Coursework	✓	✓		✓		25%	
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 Work	Application of class materials and teamwork	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Individual Coursework	Application of class materials	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Test	Understanding of class materials	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

- Statistical estimation and hypothesis testing
- Data collection, data analysis, and model prediction
- Regression modeling and analysis
- Design and analysis of Experiments
- Analysis of Variance modeling
- Process estimation and prediction
- Process characterization and improvement
- Robust design and parameter design

2. Reading List

2.1 Compulsory Readings

1.	Applied Linear Statistical Models by Kutner, Nachtsheim, Neter, and Li, 5th edition, McGraw Hill
2.	Lecture note

2.2 Additional Readings

NIL