

**City University of Hong Kong  
Course Syllabus**

**offered by Department of Electrical Engineering  
with effect from Semester A in 2020/2021**

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**Part I Course Overview**

**Course Title:** Modelling Techniques

**Course Code:** EE3211

**Course Duration:** One Semester (13 weeks)

**Credit Units:** 3

**Level:** B3

**Proposed Area:**  Arts and Humanities  
(for GE courses only)  Study of Societies, Social and Business Organisations  
 Science and Technology

**Medium of Instruction:** English

**Medium of Assessment:** English

**Prerequisites:** EE3001 Foundations of Data Engineering  
(Course Code and Title)

**Precursors:** Nil  
(Course Code and Title)

**Co-requisite:** Nil  
(Course Code and Title)

**Equivalent Courses:** EE2203 Modelling Techniques  
(Course Code and Title)

**Exclusive Courses:** Nil  
(Course Code and Title)

## Part II Course Details

### 1. Abstract

This course aims to develop students' ability to formulate, analyse and solve statistical or engineering problems using software tools, such as R. The goal of the course is to train students to become effective modellers who can build sound models to solve statistical or engineering problems in various functional areas.

### 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 <sup>#</sup>	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Describe the processes for modelling, statistical or engineering problems, and analyzing data		√	√	
2.	Formulate the statistical models for the real problems		√	√	
3.	Implement the models using software tools		√	√	√
4.	Verify the results obtained from software tool models, and communicate the analysis and findings in layman's terms.		√	√	√
		100%			

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

<sup>#</sup> 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)

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

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4			
Lecture	Explain key concepts in modelling	√	√	√	√			2 hrs/wk
Tutorial	Practice some modelling skills	√	√	√	√			1 hr/wk

#### 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			
Continuous Assessment: 70 %							
Tests (min.: 2)	√	√	√	√		45%	
#Assignments (min.: 3)	√	√	√	√		25%	
Examination: 30% (duration: 3 hrs , if applicable)							
Examination	√	√		√		30%	
* The weightings should add up to 100%.						100%	

#### Remark:

To pass the course, students are required to achieve at least 30% in course work and 30% in the examination.

# may include homework, tutorial exercise, project/mini-project, presentation

**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. Examination	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Coursework	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal levels

## 6. Constructive Alignment with Major Outcomes

Please state how the course contribute to the specific MILO(s)

MILO	How the course contribute to the specific MILO(s)
1	An ability to apply knowledge of mathematics, statistics, science and engineering.
2	An ability to design and conduct experiments as well as to analyze and interpret data.
5	An ability to identify, evaluate, formulate and solve engineering problems using statistics.
6	Awareness of professional and ethical responsibilities.
10	An ability to use necessary engineering tools.

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

#### 1. Keyword Syllabus

##### **Introduction to statistical modelling tools**

Definition of statistical modelling. Types of statistical models. Introduction of features and functions of the software tools. Examples on the above features and functions.

##### **Data Analysis using software tools**

Features of data in engineering contexts using statistics. Data analysis to support decision making. Extracting information from available data. Visualization and data processing using software tools.

##### **Real world problems**

Introduction of real world problems in different areas. Modelling of those problems. Applying the software tools to solve those problems.

##### **Analysis of modelling processes**

Plots examination. Sample size determination. Interpretation of results.

##### **Various topics in applied multivariate analysis such as multiple linear regression, logistic regression, parametric and non-parametric statistical models and longitudinal analysis.**

#### 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.)*

1.	Lecture notes
2.	Pagano M. and Gauvreau K. Principles of Biostatistics. Pacific Grove, CA: Duxbury.

##### 2.2 Additional Readings

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

1.	Thomas W. MacFarland. Introduction to Data analysis and Graphical Presentation in Biostatistics with R: Statistics in the Large.
2.	Bernard Rosner. Fundamentals of Biostatistics