

**City University of Hong Kong
Course Syllabus**

**offered by College/School/Department of Management Sciences
with effect from Semester A 2017 /18**

Part I Course Overview

Course Title:	Introduction to Mathematical Statistics
Course Code:	MS8952
Course Duration:	One Semester
Credit Units:	3
Level:	R8
Proposed Area: <i>(for GE courses only)</i>	<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:	English
Medium of Assessment:	English
Prerequisites: <i>(Course Code and Title)</i>	Nil
Precursors: <i>(Course Code and Title)</i>	Nil
Equivalent Courses: <i>(Course Code and Title)</i>	Nil
Exclusive Courses: <i>(Course Code and Title)</i>	Nil

Part II Course Details

1. Abstract

(A 150-word description about the course)

This course aims to provide a solid understanding of some of the core theoretical principles that lie behind the various estimation and testing techniques that are used in business and economic statistics. Special focus will be given to likelihood-based inference.

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.	To consolidate the core principles under econometric theory		✓		
2.	To understand and implement the technique of maximum likelihood estimation and develop an appreciation of the associated asymptotic distribution theory			✓	✓
3.	To understand and implement likelihood-based hypothesis testing			✓	✓
4.	To understand statistical issues associated with model selection in econometrics				✓
		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)

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

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4			
Interactive seminars	Course material will be delivered in seminar style lectures	✓	✓	✓	✓			
Student presentations	Seminars will be supplemented by presentation by students on special topics	✓	✓	✓	✓			

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: <u>100</u> %							
Assignments/Projects/Student Presentations/Quizzes	✓	✓	✓	✓		100%	
Examination: <u>0</u> % (duration: _____, if applicable)							
						100%	

** The weightings should add up to 100%.*

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. Assignments/Projects/Student Presentations/Quizzes	Students work on assignments based on the concepts of each topic. Students are also assessed on the knowledge of the course 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

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

- Sufficiency and exponential family of distributions
- Moments and moment-generating functions
- Minimum variance unbiased estimation
- Methods of transformation
- Likelihood principle and maximum likelihood estimation
- Maximum likelihood asymptotic theory
- Likelihood-based hypothesis test
- Loss and risk functions, model selection and pre-testing

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.)

Nil

2.2 Additional Readings

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

1.	Greene, W.H. (2008), <i>Econometric Analysis</i> , 6th edition, Prentice Hall, New York. ISBN-13: 978-0-13-513245-6 ISBN-10: 0-13-513245-2
2.	Zaman, A. (1996), <i>Statistical Foundations for Econometric Techniques</i> , Academic Press, New York ISBN 0-12-775415-6