

City University of Hong Kong

Information on a Course offered by Department of Management Sciences with effect from Semester A in 2013 / 2014

Part I

Course Title: Introduction to Mathematical Statistics

Course Code: MS8952

Course Duration: One Semester

Credit Units: 3

Level: R8

Medium of Instruction: English

Prerequisites: Nil

Precursors: Nil

Equivalent Courses: Nil

Exclusive Courses: Nil

Part II

Course Aims

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.

Course Intended Learning Outcomes (CILOs)

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

No.	CILO
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

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)

No.	TLA
CILO 1,2,3,4	Interactive seminars: course material will be delivered in seminar style lectures
CILO 1,2,3,4	Student presentations: seminars will be supplemented by presentation by students on special topics

Assessment Tasks/Activities

(Indicative of likely activities and tasks designed to assess how well the students achieve the CILOs.)

Assignments, Projects, Student Presentations, or Quizzes (100%).

No.	Type of assessment tasks/activities	Weighting (if applicable)
CILO 1,2,3,4	Assignments/Projects/Student Presentations/Quizzes	100%

Grading of Student Achievement:

Assignments/Projects/Student Presentations/Quizzes

Letter Grade	Grade Point	Grade Definitions	
A+	4.3	Excellent	Strong evidence of knowledge of subject matter and capability to formulate, analyze and solve problems with quantitative models.
A	4.0		
A-	3.7		
B+	3.3	Good	Evidence of knowledge of subject matter and capability to formulate, analyze and solve problems with quantitative models.
B	3.0		
B-	2.7		
C+	2.3	Adequate	Some evidence of knowledge of subject matter and capability to formulate, analyze and solve problems with quantitative models.
C	2.0		
C-	1.7		
F	0.0	Failure	Very little evidence of knowledge of subject matter and capability to formulate, analyze and solve problems with quantitative models.

Part III

Keyword Syllabus

- 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

Recommended Reading

Greene, W.H. (2008), *Econometric Analysis*, 6th edition, Prentice Hall, New York.
ISBN-13: 978-0-13-513245-6
ISBN-10: 0-13-513245-2

Zaman, A. (1996), *Statistical Foundations for Econometric Techniques*, Academic Press, New York
ISBN 0-12-775415-6