City University of Hong Kong
Course Syllabus

offered by Department of Mathematics
with effect from Semester B 2017 / 18

Part I Course Overview

Course Title:	**Statistical Analysis of Financial Big Data**
Course Code:	**MA6632**
Course Duration:	**1 semester**
Credit Units:	**3 CUs**
Level:	**Level 6**
Medium of Instruction:	**English**
Medium of Assessment:	**English**
Prerequisites: *(Course Code and Title)*	**MA2172 Applied Statistics for Sciences and Engineering OR MA2506 Probability and Statistics OR equivalent course of elementary statistics**
Precursors: *(Course Code and Title)*	**Nil**
Equivalent Courses: *(Course Code and Title)*	**Nil**
Exclusive Courses: *(Course Code and Title)*	**Nil**

Part II Course Details

1. Abstract

This course aims to

- introduce students statistical concepts and techniques of data analysis; and
- demonstrate applications of statistical methods and modeling techniques to scientific and engineering problems; and
- develop the use of computer software in statistical calculations.

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.	perform hypothesis testing on data sets and draw appropriate inferences about the underlying populations.	30%	V	V	
2.	construct statistical models and experimental designs from regression and analysis of variance.	20%	V	V	
3.	implement multivariate methods of analysis to data sets with inherent interdependence among variables.	20%	V	V	
4.	present a range of statistical methods for evaluating product quality and forecasting time series processes.	20%	V	V	V
5.	carry out statistical calculations and analyses with software packages.	10%		V	V
		100%			

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	5	6	
teaching	Learning through teaching is primarily based on lectures.	V	V	V	V	V		3 hours/week
take-home assignments	Learning through take-home assignments helps students implement advanced theory for better understanding	V	V	V	V	V		After-class

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	5	6		
Continuous Assessment: 30%								
Test	V	V					20	
Hand-in assignments	V	V	V	V			10	
Examination	V	V	V	V			70	
Examination: 70% (duration: 3 hrs, if applicable)								
							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-)	Adequate (C+, C, C-)	Marginal (D)	Failure (F)
1. Test	Problem solving ability	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Hand-in assignments	Comprehensive understanding	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Examinations	Creativity and problem solving ability based on comprehensive understanding	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.)

Arbitrage theory, Hedging, Binomial model, Ito's formula, Black-Scholes equation, Option Greeks

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.	
2.	
3.	
…	

2.2 Additional Readings

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

1.	Derivatives Markets, by R. McDonald
2.	Options, Futures and Other Derivatives, by J. Hull
3.	
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