

**City University of Hong Kong  
Course Syllabus**

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

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**Part I Course Overview**

<b>Course Title:</b>	<b>Applied Statistics</b>
<b>Course Code:</b>	<b>MA3518</b>
<b>Course Duration:</b>	<b>One semester</b>
<b>Credit Units:</b>	<b>3</b>
<b>Level:</b>	<b>B3</b>
<b>Proposed Area:</b> <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
<b>Medium of Instruction:</b>	<b>English</b>
<b>Medium of Assessment:</b>	<b>English</b>
<b>Prerequisites:</b> <i>(Course Code and Title)</i>	<b>MA2506 Probability and Statistics</b>
<b>Precursors:</b> <i>(Course Code and Title)</i>	<b>Nil</b>
<b>Equivalent Courses:</b> <i>(Course Code and Title)</i>	<b>Nil</b>
<b>Exclusive Courses:</b> <i>(Course Code and Title)</i>	<b>Nil</b>

## Part II Course Details

### 1. Abstract

(A 150-word description about the course)

This course aims to give a more in-depth study of statistics with emphasis on data analysis and applications to concrete problems. It helps students understand concepts and techniques of useful statistical methods, and apply statistical tests to diversified real-life problems with software packages.

### 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.	perform statistical calculations and analyzes with software package(s), including SAS.	10%	Y		
2.	create and construct linear models and experimental designs which use regression and analysis of variance.	20%	Y	Y	
3.	apply a range of statistical methods to evaluate product quality and forecast time series processes.	10%		Y	
4.	apply statistical techniques in assessing risks and modeling related problems.	20%	Y	Y	Y
5.	perform statistical tests which analyze data sets from scientific studies and determine appropriate data-fitting models.	20%		Y	Y
6.	the combination of CILOs 1-5	20%	Y	Y	Y
		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	5	6	
Lecture	Learning through <b>teaching</b> is primarily based on lectures.	Y	Y	Y	Y	Y	Y	26 hours in total
Laboratory sessions	Learning through <b>laboratory sessions</b> helps students implement	Y						13 hours in total

	techniques of solving statistical problems and analyzing data sets with computing packages, such as SAS.							
Take-home assignments	Learning through <b>take-home assignments</b> helps students apply basic statistical methods and tests in a range of applications, including quality control and time series analysis.	Y	Y	Y	Y	Y		after-class
Project	Learning through <b>project</b> helps students formulate real-life problems in a statistical framework with the aid of methods and computing techniques introduced in this course. It also helps students to communicate and collaborate effectively in the team.	Y	Y	Y	Y	Y		after-class
Math Help Centre	Learning activities in <b>Math Help Centre</b> provides students extra help.		Y	Y	Y			after-class
...								

#### 4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

50% Coursework

50% Examination (Duration: 3 hours, at the end of the semester)

For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

Assessment Tasks/Activities	CILO No.						Weighting*	Remarks
	1	2	3	4	5	6		
Continuous Assessment: <u>50</u> %								
Test	Y	Y			Y		15-30%	Questions are designed for the first part of the course to see how well students have learned the basics of SAS in statistical work and the techniques of regression and analysis of variance.

Hand-in assignments	Y	Y	Y	Y	Y		0--20%	These are skills based assessment which enables students to analyze experimental data and model real-life phenomena with statistical methods and computing techniques.
Project	Y	Y	Y	Y	Y		0-30%	Students are assessed on their ability in applying statistical and computational methods to formulate concrete problems by data testing and model fitting, as well as on the presentation of results with analysis.
Formative take-home assignments	Y	Y	Y	Y	Y		0%	The assignments provide students chances to demonstrate their achievements on methods of applied statistics learned in this course.
Examination: <u>50</u> % (duration: 3 hrs, if applicable)								Examination questions are designed to see how far students have achieved their intended learning outcomes. Questions will primarily be skills and understanding based to assess the student's versatility in applied statistical methods.
							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. Test	Ability to understand the basics of SAS in statistical work and the techniques of regression and analysis of variance	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Hand-in assignments	Ability to analyze experimental data and model real-life phenomena with statistical methods and computing techniques	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Projects	Ability to apply statistical methods to formulate concrete problems by data testing and present the models with analysis	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Examination	Ability to solve modeling related problems with appropriate statistical methods and the SAS software	High	Significant	Moderate	Basic	Not even reaching marginal levels
5. Formative take-home assignments	Ability to demonstrate students' achievements on methods of applied statistics learned in this course	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.)*

Linear regression; Nonparametric methods; Bayesian methods; Quality control; Analysis of Variances; Computer-based practice; Risk analysis; Time series.

**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.)*

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2.	
3.	
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**2.2 Additional Readings**

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

1.	
2.	
3.	
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