**City University of Hong Kong**
**Course Syllabus**

**offered by Department of Management Sciences**
**with effect from Semester B 2018 /19**

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**Part I Course Overview**

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|---|---|
| **Course Title:** | Statistics for Economic and Financial Modelling |
| **Course Code**: | MS4504 |
| **Course Duration:** | One Semester |
| **Credit Units**: | 3 |
| **Level**: | B4 |
| **Proposed Area:** *(for GE courses only)* | ☐ Arts and Humanities<br>☐ Study of Societies, Social and Business Organisations<br>☐ Science and Technology |
| **Medium of Instruction:** | English |
| **Medium of Assessment:** | English |
| **Prerequisites**: *(Course Code and Title)* | Nil |
| **Precursors**: *(Course Code and Title)* | CB2200 Business Statistics |
| **Equivalent Courses**: *(Course Code and Title)* | Nil |
| **Exclusive Courses**: *(Course Code and Title)* | Nil |

## Part II Course Details

### 1. Abstract

*(A 150-word description about the course)*

This course aims to:

- Provide students with a solid understanding of the range of statistical modelling techniques used in economic and financial analysis; Special emphasis is placed on the analysis of economic and financial data;
- Demonstrate the relevance of these statistical modelling techniques through examples and case studies;
- Acquaint students with the necessary computing knowledge to execute the analysis.

### 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. | Apply the statistical modelling techniques learnt in the course to solve real world problems in economics and finance | | | ✓ | ✓ |
| 2. | Select the most appropriate statistical modelling techniques for a given problem | | ✓ | ✓ | |
| 3. | Evaluate the validity of the statistical modelling findings | | ✓ | ✓ | |
| 4. | Appreciate the relevance of statistics in economics and finance | | | ✓ | |
| 5. | Understand the basic operations of financial markets and apply such knowledge in investment and in making other financial decisions | | | ✓ | |
| ** If weighting is assigned to CILOs, they should add up to 100%.* | | 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 | 5 | | |
| Lecture / Tutorial | Presents theories and software demonstrations to a large group | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Computer laboratory | Software demonstrations, computer assignments | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Group discussions | Group discussions on major issues in class | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Reading assignments | Students are assigned to read selected pages of compulsory and additional texts | | ✓ | ✓ | ✓ | ✓ | | |

## 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 | | | |
| Continuous Assessment: __40__% | | | | | | | | |
| **Computer assignment / problem set**<br><br>Students work individually or in small groups to analyse real-world data set(s) using a software taught in lectures. | ✓ | ✓ | ✓ | ✓ | | | 20% | |
| **Test**<br><br>The test is designed to assess students' knowledge of selecting and applying the most suitable statistical technique to solve real-world problems. | ✓ | ✓ | ✓ | | ✓ | | 20% | |
| Examination: __60__% (duration: 2 hours, if applicable) | | | | | | | | |
| **Examination**<br><br>The exam is designed to assess students' knowledge of selecting and applying different statistical methods to solve problems. Computer output may be used for students' interpretation. | ✓ | ✓ | ✓ | | ✓ | | 60% | |
| ** The weightings should add up to 100%.* | | | | | | | 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. Computer assignment / problem set | RECOGNIZE the most appropriate model to model a data set and INTERPRET software printouts | High | Significant | Moderate | Basic | Not even reaching marginal level |
| 2. Test | GRASP of subject and UNDERSTANDING of course materials | High | Significant | Moderate | Basic | Not even reaching marginal level |
| 3. Written Examination | Capacity to ANALYZE and ORGANISE ; and GRASP of subject material | High | Significant | Moderate | Basic | Not even reaching marginal level |

**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.)*

**Regression Analysis**
Least squares estimates; inference about regression parameters; residual analysis

**Model Building and Variables Selection**
Criteria for comparing models; sequential F-test; variables selection strategies

**Forecasting Methods**
Moving averages; exponential smoothing; models for seasonal data

**Time Series Analysis**
Stationarity of time series; autocorrelations and partial autocorrelations; ARIMA models

**Selected Advanced Topics**
Transfer function models / intervention analysis / cointegration / ARCH & GARCH models / option pricing models

**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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|---|---|
| 1. | Dielman, T.E. Applied Regression Analysis for Business and Economics, Duxbury, latest edition |
| 2. | Bowerman, B.L. and R.T. O'Connell, Forecasting and Time Series: An Applied Approach, Duxbury, latest edition |

**2.2 Additional Readings**

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

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|---|---|
| 1. | Brooks, C. Introductory Econometrics for Finance, Cambridge, latest edition |
| 2. | DeLurgio, S.A., Forecasting Principles and Applications, McGraw-Hill, latest edition |
| 3. | Pindyck, R.S. and K.L. Rubinfeld, Econometric Models and Economic Forecasts, McGraw-Hill, latest edition |
| 4. | Watsham, T.J. and K. Parramore, Quantitative Analysis in Finance, Thomson Publishing Asia, latest edition |