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

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

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## Part I Course Overview

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|---|---|
| **Course Title:** | Managerial Decision Modeling |
| **Course Code**: | MS5313 |
| **Course Duration:** | One Semester |
| **Credit Units**: | 3 |
| **Level**: | P5 |
| **Medium of Instruction:** | English |
| **Medium of Assessment:** | English |
| **Prerequisites**: *(Course Code and Title)* | Nil |
| **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

Serving as a foundation course for developing advanced analytical and planning skills, this course aims to sharpen students' ability to creatively design, formulate, and construct quantitative models for managerial decision problems. Specifically, this course is intended to

- Provide students with the key concepts, knowledge, and tools to use data, analytical models and information technology to support practical managerial decision-making.
- Develop students' basic skills and hands-on experiences to uncover useful information and to analyse various business decision problems
- Expose students to the practical cases of how quantitative modelling and analysis skills have generated significant business values and competitive advantages.

### 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. | Demonstrate the attitude and/or ability to discuss the basic knowledge in concepts, principles and benefits of quantitative methods and analytical models. | | ✓ | ✓ | |
| 2. | Apply quantitative methods to design, formulate, and create analytical models for managerial decision problems in a precise and creative manner. | | | ✓ | |
| 3. | Evaluate the analytical results and recommend best possible solutions for managerial decision making. | | | ✓ | ✓ |
| | | 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 | | | | |
| Interactive Lectures | Class sessions will be devoted to probing, extending and applying the general knowledge related to the concepts, principles and benefits of quantitative methods and analytical models:<br>• The "Tell-Show-Do" sequence will be adopted to provide students with hands-on experience on how to develop and apply the relevant techniques.<br>• While those skills necessary to manipulate the quantitative techniques are developed, examples and case studies will be used to emphasize the crucial skills of describing and defining the problem before the conduct of any analysis is performed.<br>• Students will be asked to discuss and respond to the questions arising from the examples or the case study problems. | ✓ | ✓ | ✓ | | | | 3 hours / week |
| Computer Lab Activities | Whenever available, computer software packages will be introduced as a tool for solving managerial decision models with relevant quantitative techniques, so that students can actually bring what they learnt to their place of work. | ✓ | ✓ | | | | | |

## 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: __30__% | | | | | | | | |
| Course Assignment | ✓ | ✓ | ✓ | | | | 20% | |
| Class Participation | ✓ | ✓ | ✓ | | | | 10% | |
| Examination: __70__% (duration: 2 hours if applicable) | | | | | | | | |
| Written Examination | ✓ | ✓ | ✓ | | | | 70% | |
| | | | | | | | 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. Course Assignment | Strong evidence of abilities to design and solve managerial decisions models | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| 2. Class Participation | Participate actively and professionally during in-class discussions | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| 3. Examination | Demonstrate understanding of key concepts and abilities to design and solve managerial decisions models as well as to interpret the solutions | 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.)*

**Introduction to Modelling and Management Science**

Modelling for Managerial Decisions. Quantitative vs. qualitative Problem Solving Process. Use and Implementation of Modelling

**Basic Concepts in Probability and Statistics**

Expected Values. Standard Deviation. Normal Distribution. Concepts of Sampling. Estimation and Confidence Intervals. Data analysis using Excel

**Time Series Analysis**

Time series forecasting techniques and their applications. Moving averages. Exponential Smoothing. Seasonality. Trend models.

**Regression Analysis**

Simple Linear Regression models. Estimation and prediction using regression method. Interpretation of regression parameters and coefficient of correlation.

**Discriminant and Classification Analysis**

The two-group discriminant problem. The k-group discriminant problem. Excel implementation and business applications.

**Constrained Optimization techniques**

Optimization modelling. Linear Programming formulation. Using Excel Solver to solve constrained optimization problem.

Other constraint optimization models (including Integer and Non-linear programming problems) and their applications.

**Multiple Objective Decision Making Techniques**

Multiple objective decision problems and decision making tools. The Analytical Hierarchy Process.

**Implementation Issues**

Success, challenges and issues in quantitative managerial decision support. Uses and abuses of quantitative results in real-Life situations. Strengths and limitations of quantitative 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.)*

Nil

### 2.2 Additional Readings

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

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| 1. | George E. Monahan, Management Decision Making: Spreadsheet Modeling, Analysis, and Applications (2000), Cambridge University Press, Cambridge, England, ISBN: 0 521 78118 3 |
| 2. | S. Christian Albright, Wayne Winston, Christopher Zappe, Data Analysis and Decision Making with Microsoft® Excel, Revised, 3rd Edition, ISBN-10: 0324662440, ISBN-13: 9780324662443, © 2009 |
| 3. | Cliff Ragsdale, Spreadsheet Modeling & Decision Analysis: A Practical Introduction to Management Science, Revised, 5th Edition, Virginia Polytechnic Institute, ISBN-10: 0324656637, ISBN-13: 9780324656633 © 2008 |
| 4. | Taylor, B W, Introductory Management Science, 8/e (2004, Prentice Hall) |
| 5. | Levine, D M, Stephan, D, Krehbiel, T C and Berenson, M L: Statistics or Managers, 4/e (2005, Prentice Hall) |
| 6. | Wisniewski, M: Quantitative Methods for Decision Makers (2002, Prentice Hall) |
| 7. | www.informs.org |