

City University of Hong Kong

**Information on a Course
offered by Department of Management Sciences
with effect from Semester A in 2009 / 2010**

Part I

Course Title: Quantitative Decision Making Techniques

Course Code: MS5720

Course Duration: One Semester

No. of Credit Units: 3

Level: P5

Medium of Instruction: English

Prerequisites: Nil

Precursors: Nil

Equivalent Courses: Nil

Exclusive Courses: Nil

Part II

Course Aims

This course aims to provide students with a basic understanding of probability and statistics; knowledge of a wide range of quantitative techniques and their assumptions; the ability to apply an appropriate method to analyse and interpret solutions for problem solving and decision making.

Course Intended Learning Outcomes (CILOs)

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

No.	CILOs	Weighting
1.	Demonstrate basic knowledge and understanding of the concepts of confidence interval estimation, hypothesis testing, linear regression modelling and time series forecasting modelling, decision analysis, linear programming models, network models and inventory models.	3
2.	Select and apply an appropriate quantitative model to formulate a problem situation in business and operations management	3
3.	Apply the appropriate methodology to analyse and solve different quantitative models	3
4.	Evaluate different alternatives based on the appropriate model solution for decision support	2

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)

1. Lecture

Concepts and applications of various statistical and quantitative analyses to problem solving and decision making are explained. (Analysis methods included are regression, forecasting, linear programming and inventory models)

In-class exercises in the form of short questions are designed to test students' understanding of the concepts and methods learned in a lecture. The lecturer will give further explanation to the class at the end of the exercise.

2. Tutorial

Tutorial exercises are designed to develop students' analytical skills in problem formulation, solution generation and interpretation. These are take-home exercises for students to practise after a lecture and to share and participate in class discussion during the next tutorial. The lecturer will facilitate the class discussion and give feedback and comments.

Constructive Alignment of CILOs and Teaching and Learning Activities

CILO	TLA1 : Lecture	TLA2 : Tutorial
1	Yes	Yes
2	Yes	Yes
3	Yes	Yes
4		Yes

Assessment Tasks/Activities

(Indicative of likely activities and tasks designed to assess how well the students achieve the CILOs. Final details will be provided to students in their first week of attendance in this course)

Written examination (2 hours)	70%
Mid-term test	20%
Tutorial participation (Exercises and attendance)	10%
Total	100%

Constructive Alignment of CILOs and Assessment Methods

	Written examination (2 hours)	Mid-term test	Tutorial participation
CILO 1	2	2	2
2	2	2	2
3	2	2	2
4	1	1	2
Total	70%	20%	10%

(1 : Minor focus on the CCILO;

2 : Main focus on the CILO)

Grading of Student Achievement:

Refer to Grading of Courses in the Academic Regulations for Taught Postgraduate Degrees.

Written Examination

Letter Grade	Grade Point	Grade Definitions	
A+	4.3	Excellent:	Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.
A	4.0		
A-	3.7		
B+	3.3	Good:	Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.
B	3.0		
B-	2.7		
C+	2.3	Adequate:	Understanding of the subject; ability to develop solutions to simple problems in the material.
C	2.0		
C-	1.7		
D	1.0	Marginal:	Sufficient familiarity with the subject matter to enable the student to progress without repeating the course.
F	0.0	Failure:	Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.

Mid-term Test

Letter Grade	Grade Point	Grade Definitions	
A+	4.3	Excellent:	Strong evidence of understanding the key concepts and definitions of the learned subject; capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.
A	4.0		
A-	3.7		
B+	3.3	Good:	Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.
B	3.0		
B-	2.7		

C+	2.3	Adequate:	Understanding of the subject; ability to show some evidence of familiarity with literature.
C	2.0		
C-	1.7		
D	1.0	Marginal:	Sufficient familiarity with the subject matter to enable the student to progress further.
F	0.0	Failure:	Little evidence of familiarity with the subject matter; limited or irrelevant use of literature.

Tutorial Participation

Letter Grade	Grade Point	Grade Definitions	
A+	4.3	Excellent:	Strong evidence of showing familiarity with key concepts and definitions. Clearly and correctly states most critical points and makes important contributions to the assigned questions or problems. Critically discusses issues and demonstrates awareness of most relevant implications to apply to daily life examples of service experiences. High participation and excellent presentation skills.
A	4.0		
A-	3.7		
B+	3.3	Good:	Evidence of showing familiarity with key concepts and definitions. Clearly and correctly states some critical points and makes contributions to the assigned questions or problems. Critically discusses issues and demonstrates awareness of some relevant implications to apply to daily life examples of service experiences. High participation and good presentation skills.
B	3.0		
B-	2.7		
C+	2.3	Adequate:	Evidence of showing adequate review of literature and key concepts. Understanding of the subject, ability to develop solutions to simple and basic problems in the assigned questions and problems.
C	2.0		
C-	1.7		
D	1.0	Marginal:	States a few critical points and marginal contributions of the assigned questions and problems.
F	0.0	Failure:	Little or no ability to state a few critical points and no contribution of the assigned questions and problems.

Part III

Keyword Syllabus:

1. Introduction to Modelling and Management Science

Model building and management science. MS/OR problem solving process. Constraints in the MS/OR field.

2. Resource Allocation Using Linear Programming

Problem formulation. Graphical and computer solution. Interpretation of computer solution. Sensitivity analysis. The transportation problem. The assignment problem.

3. Basic Probability Concepts

Expected values. Standard deviation. Normal distribution. Concepts of sampling. Estimation and confidence intervals. Hypothesis testing.

4. Regression and Correlation

Linear regression. Interpretation of regression parameters and coefficient of correlation.

5. Forecasting

Exploration of time-series forecasting techniques.

6. Decision Analysis

Decision making under risk. Decision trees. Opportunity loss. Expected value of perfect information. Expected value of sample information.

7. Project Management

Project network. Critical path method. Project evaluation and review technique.

8. Inventory Management

The inventory problem. Economic order quantity (EOQ). The EOQ model with non-instantaneous receipt. The EOQ with discounts.

Recommended Reading:

1. B W Taylor, Introduction to Management Science, 9/e, Prentice Hall, 2007
2. R I Levin and D S Rubin, Statistics for Management, 7/e, Prentice Hall, 1998