

# The Hong Kong Polytechnic University

## Subject Description Form

<b>Subject Code</b>	LGT5102
<b>Subject Title</b>	Models for Decision Making
<b>Credit Value</b>	3
<b>Level</b>	5
<b>Normal Duration</b>	1-semester
<b>Exclusion</b>	MGT532 Deterministic Operations Research
<b>Objectives</b>	<ul style="list-style-type: none"> <li>▪ To introduce students to the methodology of management science as a scientific approach to turn data into insight for managerial decision making.</li> <li>▪ To impart to students the concepts, theories and techniques of a variety of management science methods.</li> <li>▪ To develop students' ability and confidence in management science methods for solving management decision problems.</li> </ul> <p>This subject contributes to the following Intended Learning Outcomes for the MSc programme(s):</p> <p>MSc in Global Business and Decision Analysis</p> <p>#3 Demonstrate understanding on the concepts of common decision-making models</p>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a. Understand the methodology of management science as a scientific approach to turn data into insight for managerial decision making.</li> <li>b. Understand the concepts, theories and techniques of a variety of management science methods.</li> <li>c. Develop the ability and confidence in management science methods for solving management decision problems.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><b>Introduction</b> Applications and impact; nature of management science; history; rise of business analytics; modeling approach; useful spreadsheet tools.</p> <p><b>Linear Programming</b> Formulation; graphical solution; simplex algorithm; sensitivity analysis; solver table; 100% rule; applications.</p> <p><b>Integer Programming</b> Formulation; Branch and Bound method; applications.</p> <p><b>Network Models</b></p>

	<p>Transportation and assignment application; network flow problems.</p> <p><b>Queueing models</b> Examples of queueing systems; simulation example; performance measures; Little's law; single server models (M/M/1, M/D/1, G/G/1); multiple server models (M/M/s) and quality-efficiency regime; priority models; economic analysis.</p> <p><b>Spreadsheet modeling in practice</b> Process of spreadsheet modeling; guidelines for good spreadsheet model; methods for testing spreadsheet models.</p> <p><b>Case Study</b> Application of management science models in real-life managerial decision making.</p>																																																														
<p><b>Teaching/ Learning Methodology</b></p>	<p>Concepts and techniques will be introduced through lectures. Students are required to apply the knowledge and skills to analyse and solve various realistic management science problems in the form of case study. The use of relevant computer package will be encouraged.</p>																																																														
<p><b>Assessment Methods in Alignment with Intended Learning Outcomes</b></p>	<table border="1" data-bbox="391 976 1347 1700"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>Continuous Assessment*</td> <td>100 %</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1. Attendance and class participation</td> <td>10%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2. Assignment, quiz, case study, etc.</td> <td>20 %</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3. Term project</td> <td>30%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4. Comprehensive test</td> <td>40 %</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>100 %</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Coursework includes homework assignments, class participation, test(s), term project/group case study, etc. Through term project, students learn to apply the theories to some real life situations. Comprehensive test is also required to test their understanding and familiarity with the knowledge.</p>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						a	b	c				Continuous Assessment*	100 %							1. Attendance and class participation	10%	✓	✓	✓				2. Assignment, quiz, case study, etc.	20 %	✓	✓	✓				3. Term project	30%	✓	✓	✓				4. Comprehensive test	40 %	✓	✓	✓				Total	100 %						
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	<p>*Weighting of assessment methods/tasks in continuous assessment may be different, subject to each subject lecturer.</p> <p>To reflect the significant technology content in this subject, 10% (or more) of the overall weighting of this subject is based on individual assessment concerning technology-related knowledge.</p>	
<b>Student Study Effort Expected</b>	Class contact:	
	<ul style="list-style-type: none"> <li>▪ Lectures / Tutorials</li> </ul>	39 Hrs.
	Other student study effort:	
	<ul style="list-style-type: none"> <li>▪ Revision, doing exercises and cases</li> </ul>	87 Hrs.
	Total student study effort	126 Hrs.

<b>Reading List and References</b>	<p><b><i>Reading List &amp; References</i></b></p> <p>F.S. Hillier and M.S. Hillier, Introduction to Management Science, latest edition, McGraw Hill</p> <p>Hillier, F.S. and Liebermann, G.J., <i>Introduction to Operations Research</i>, latest ed., McGraw-Hill.</p> <p>Winston, W.L., <i>Operations Research: Algorithms and Applications</i>, latest ed., Duxbury Press.</p> <p><b><i>Journals</i></b></p> <p>Informs Journal on Applied Analytics (formerly, Interfaces) OR/MS Today</p>
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