The Hong Kong Polytechnic University

Subject Description Form

Subject Code	LGT6201
Subject Title	Optimization Models and Methodologies
Credit Value	3
Level	6
Normal Duration	1-semester
Pre-requisite / Co-requisite/ Exclusion	Linear algebra, advanced mathematics
Role and Purposes	To introduce basic optimization methods with focus on deterministic models
Subject Learning Outcomes	 Upon completion of the subject, students will be able to: a. Understand basic optimization models and methods for operations research. b. Have the capability to formulate real-life and research problems into optimization models. c. Have the capability to develop and apply optimization methods to solve problems. d. Have the capability to examine the performance of different optimization models and methods from both theoretical and numerical perspectives.
Subject Synopsis/ Indicative Syllabus	Linear and nonlinear programming (21 hours): linear programming basic models and methods; duality; sensitivity analysis; parametric programming; unconstrained nonlinear optimization; constrained nonlinear optimization. Network flow algorithms (18 hours): graphs and networks; general formulation; shortest path problem; maximum flow problem; minimum cost flow problem
Teaching/Learning Methodology	Lectures and tutorials, after class assignments, exams

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Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		а	b	с	d		
1. Continuous Assessment	60%	~	~	~	~		
2. Final Exam	40%	1	~	~	~		
Total	100 %					·1	
 Explanation of the appropriateness of the assessment methods in assessing intended learning outcomes: The continuous assessment components include two quizzes and one midtest. The final exam is comprehensive. The tests and examinations are des to assess students' achievement of all learning outcomes. The midterm and Final exams are comprehensive, requiring students to r business problems in an optimization language and apply the tools introduce the subject to obtain optimal solutions, which have embedded in them businesights. The quiz questions are on the specific topics covered in the subject 							
Class contact:							
Lecture/Tutorial				39 Hrs.			
Other student study effort:							
Self Study				87 Hrs.			
Total student study effort				126 Hrs.			
Luenberger, D., Y. Ye. 2010. Linear and Nonlinear Programming. Springer							
Dantzig, G., M. Thapa. 1997. Linear Programming. Springer							
Paul A. Jensen and Jonathan F. Bard, (2003) <i>Operations Research: Models and Methods</i> , John Wiley & Sons, Inc.							
Ravindra K. Ahuja, Thomas L. Magnanti, and James B. Orlin, (1993) <i>Flows: Theory, Algorithms, and Applications</i> , Pearson Education, Inc.							twork
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Final Exam 40% \checkmark \checkmark \checkmark \checkmark Total 100% \checkmark \checkmark \checkmark \checkmark Explanation of the appropriateness of the assessment methods in as intended learning outcomes:The continuous assessment components include two quizzes and or test. The final exam is comprehensive. The tests and examinations at to assess students' achievement of all learning outcomes.The midterm and Final exams are comprehensive, requiring student business problems in an optimization language and apply the tools in the subject to obtain optimal solutions, which have embedded in the insights. The quiz questions are on the specific topics covered in the student study effort:•Lecture/Tutorial•Lecture/Tutorial•Self Study•Self StudyDantzig, G., M. Thapa. 1997. Linear And Nonlinear Programming. SpringerPaul A. Jensen and Jonathan F. Bard, (2003) Operations Research: 1 Methods, John Wiley & Sons, Inc.Ravindra K. Ahuja, Thomas L. Magnanti, and James B. Orlin, (199 Flows: Theory, Algorithms, and Applications, Pearson Education, Inc.	Specific assessment methods/tasks % Intended subject learning outcomes to be assessed (Please tick as appropriate is a supportance) 1. Continuous Assessment 60% ✓