

The Hong Kong Polytechnic University

Subject Description Form

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| Subject Code | LGT6201 |
| Subject Title | Optimization Models and Methodologies |
| Credit Value | 3 |
| Level | 6 |
| Normal Duration | 1-semester |
| Pre-requisite / Co-requisite/ Exclusion | Nil |
| 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 capability to formulate real-life and research problems into mathematical optimization models. c. Have capability to develop and apply optimization methods to solve problems. d. Have capability to examine 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, sensitivity analysis, duality, unconstrained nonlinear optimization, constrained nonlinear optimization. Network flow algorithms (18 hours): graphs and networks; general formulation; shortest path problem and algorithms; maximum flow problem and algorithms; minimum cost flow problem and algorithms |
| Teaching/Learning Methodology | Lectures and tutorials, after class assignments, exams |

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| Assessment Methods in Alignment with Intended Learning Outcomes | Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | |
| | | | a | b | c | d | | |
| | 1. Continuous Assessment | 50% | | | | | | |
| | Midterm Exam | 50% | ✓ | ✓ | ✓ | ✓ | | |
| | 2. Final Exam | 50% | ✓ | ✓ | ✓ | | | |
| Total | 100 % | | | | | | | |
| <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p><i>To pass this subject, students are required to obtain Grade D or above in BOTH the Continuous Assessment and Exam components.</i></p> | | | | | | | | |
| Student Study Effort Expected | Class contact: | | | | | | | |
| | ▪ | Lecture/Tutorial | 39 Hrs. | | | | | |
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| | Other student study effort: | | | | | | | |
| | ▪ | Self Study | 87 Hrs. | | | | | |
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| | Total student study effort | | 126 Hrs. | | | | | |
| Reading List and References | <p>Luenberger, D., Y. Ye. 2010. <i>Linear and Nonlinear Programming</i>. Springer</p> <p>Dantzig, G., M. Thapa. 1997. <i>Linear Programming</i>. Springer</p> <p>Paul A. Jensen and Jonathan F. Bard, (2003) <i>Operations Research: Models and Methods</i>, John Wiley & Sons, Inc.</p> <p>Ravindra K. Ahuja, Thomas L. Magnanti, and James B. Orlin, (1993) <i>Network Flows: Theory, Algorithms, and Applications</i>, Pearson Education, Inc.</p> | | | | | | | |