The Hong Kong Polytechnic University

Subject Description Form

Subject Code	LGT6006
Subject Title	Statistics and Game Theoretic Methods for Business Analysis and Decisions
Credit Value	3
Level	6
Normal Duration	1-semester
Pre-requisite / Co-requisite/ Exclusion	Introduction to Probability Theory (or equivalent subjects) Advanced Mathematics
Role and Purposes	The basic objectives of this subject are the following: a. To provide basic knowledge on game theory and statistics. b. To understand the fundamentals of statistics. c. To expose students to research problems which need both equilibrium analysis of games and empirical studies.
Subject Learning Outcomes	Upon completion of the subject, students will be able to: a. Apply basic game theoretical methods to solve problems of practical interest, and interpret business phenomena from a game theoretical perspectives. b. Derive and interpret basic statistical and econometric methods, and be able to apply appropriate techniques in research design. c. Understand basic probability and statistics techniques, and be able to incorporate relevant analysis in quantitative studies.
Subject Synopsis/ Indicative Syllabus	The subject aims to armor students with necessary knowledge on statistics and game theoretical methods, and is suitable for business postgraduate students to get prepared for quantitative analysis. It consists of two parts: game theory and statistics. In the first part, the subject introduce the concept of Nash equilibrium along with specific topics in non-cooperative Bayesian games. Classical game models will be discussed to shape students' logical thinking, and the latest issues in supply chain, behavioral study, information management will be covered. In the second part, the subject covers probability theory, common families of distributions, multivariate transformation, random sample and statistics.
Teaching/Learning Methodology	Teaching mode is a combination of lectures, assignments, class discussions and examinations. Concepts and technical knowledge of game theoretical methods and statistics will be covered in lectures. Students are expected to read relevant materials before lectures and are encouraged to discuss with the lecturer about the issues arising from lectures and research topics related to the subject.

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			
Continuous Assessments	**50%**						
1. Assignments	20%	✓	✓	✓			
2. Midterm	30%	✓	✓	✓			
Final Examination	**50%**	✓	✓	✓			
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:
Frequent assignments ask students to apply the specific knowledge discussed in class to well-designed exercises with both theoretical and practical relevance. Midterm and Final Exam are comprehensive and test students' understanding of all relevant subjects. The results are expected to unbiasedly reveal the extent to which students grasp the knowledge and achieve the desired learning outcomes.

To pass this subject, students are required to obtain Grade D or above in the Continuous Assessment and Final Exam components.

Student Study Effort Expected

Class contact:	
· Lecture/Tutorial	39 Hrs.
Other student study effort:	
· Assignments	40 Hrs.
· Review and paper study	40 Hrs.
Total student study effort	119 Hrs.

Reading List and References

1. Fudenberg and Tirole (1992), *Game Theory*, MIT Press.
2. Tirole, J (1988), *Theory of Industrial Organization*, MIT Press.
3. George Casella, Roger L. Berger (2002), *Statistical Inference*, Brooks/Cole Cengage Learning