## The Hong Kong Polytechnic University

## **Subject Description Form**

Subject Code	LGT6204					
Subject Title	Inventory and Supply Chain Management					
Credit Value	3					
Level	6					
Normal Duration	1-semester					
Pre-requisite / Co-requisite/ Exclusion	Students are required to complete the following two pre-requisite subjects: LGT6201 Optimization Models and Methodologies LGT6006 Statistics and Game Theoretic Methods for Business Analysis and Decisions					
Role and Purposes	<ul> <li>Provide a fundamental knowledge base of inventory management</li> <li>Provide an overview over current research trends in supply chain management</li> <li>Train advanced theoretical research methods common in the field of inventory and supply chain management</li> <li>Provide a forum for interactive discussions of research methods and results derived from recent studies in the field</li> </ul>					
Subject Learning Outcomes	<ul> <li>Upon completion of the subject, students will be able to:</li> <li>a) Develop their abilities to apply the analytical methods to solve the complex research problems.</li> <li>b) Identify promising research questions in the field of inventory and supply chain management.</li> <li>c) Effectively and instructively communicate with their peers.</li> </ul>					
Subject Synopsis/ Indicative Syllabus	The course is divided into two parts. The first part lays the foundation of inventory management and the second part introduces the current research issues in the field of supply chain management. The first part covers selected classical models in inventory management and the methodologies used to analyze the corresponding optimization problems. The details are listed below. - EOQ model - One warehouse multi-retailer model - Introduction to dynamic programming - Dynamic economic lot size model - Stochastic inventory models					

	- Stochastic inventory and pricing models								
Teaching/Learning	<ul> <li>The second part discusses the evolving research topics and issues in supply chain management and stimulates students to formulate their own research topics. The topics of in-class discussion and selected articles include, but are not limited to the following: <ul> <li>Supply chain sourcing, contracting and coordination</li> <li>Channel management</li> <li>Social responsible operations</li> <li>Firm/consumer behavior and its impact on supply chain management</li> </ul> </li> </ul>								
Methodology	bear ming in ins subject is based on a series of rectures and interactive discussions between the lecturers and the students.								
Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weight	ing In	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
	1. Continuous Assessment	100%	č		C				
	Homework	35%	v	/ _/					
	Class presentation	35%							
	Course project	30%	~						
	Total	100 %							
	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:								
	The homework and class presentation intend to test the students' understanding of the inventory and supply chain management issues discussed in the class and covered in the reading list.								
	The course project motivates the student to conduct the preliminary study to identify a potential promising research topic related to inventory and supply chain management.								
	To pass this subject, students are required to obtain Grade D or above in the Continuous Assessment components.								
	Class contact:								
	Lecture/ Tutorial     39 H			39 Hrs.					

	Other student study effort:						
	<ul> <li>After-class homework</li> </ul>	20 Hrs.					
Effort Expected	<ul> <li>Reading assignment</li> </ul>	33 Hrs.					
	Course project	34 Hrs.					
	Total student study effort	126 Hrs.					
Reading List and	Inventory Management						
References	1. Simchi-Levi, D., Chen, X., & Bramel J. 2014. The Logic of Logistics. Springer.						
	2. Zipkin, P. 2000. Foundationss of Inventory Management. McGraw-Hill.						
	<ol> <li>Porteus, E. 2002. Foundations of Stochastic Inventory The Books.</li> <li>Bertsekas, D. 2012. Dynamic Programming and Optimal Oscientific.</li> <li>Roundy, R. 1985. 98% effective integer-ratio lot-sizing for retailer systems. Management Science 35, 1433-1442.</li> </ol>						
	<ol> <li>Wagner, H.M. &amp; Whitin, T.M. 1958. D model. <i>Management Science</i> 5, 89-96.</li> </ol>	ynamic version of the economic lot size					
	<ol> <li>Florian, M. &amp; Klein, M. 1971. Deterministic production planning with concave costs and capacity constraints. <i>Management Science</i> 18, 12-20.</li> </ol>						
	8. Scarf, H. 1960. The optimalities of ( <i>s</i> , <i>S</i> problem. In K. Arrow, S. Karlin, P. Sup <i>Social Sciences</i> , Stanford University Pr	5) policies in the dynamic inventory opes (Eds) <i>Mathematical Methods in the</i> ess.					
	9. Clark, A. & Scarf, H. 1960. Optimal po problem. <i>Management Science</i> <b>6</b> , 475-4	licies for a multi-echelon inventory 190.					
	10. Federgruen, A. & Heching, A. 1999. Co under uncertainty. <i>Operations Research</i>	combined pricing and inventory control $h$ <b>47</b> (3), 454-475.					
	<ol> <li>Chen, X. &amp; Simchi-Levi, D. 2004a. Constrategies with random demand and fixed Operations Research 52, 887-896.</li> </ol>	ordinating inventory control and pricing ed ordering cost: the finite horizon case.					
	12. Chen, X. & Simchi-Levi, D. 2004b. Co strategies with random demand and fixe Mathematics of Operations Research 29	ordinating inventory control and pricing ed ordering cost: the infinite horizon case. <b>9</b> , 698-723.					
	Supply Chain Management						
	<ol> <li>A. Tsay, S Nahmias, N Agrawal.1999.</li> <li>Quantitative models for supply chain m</li> </ol>	Modeling supply chain contracts: A review. anagement, 299-336.					
	2. A Tsay. 1999. The quantity flexibility c Management science, 45 (10), 1339-13	contract and supplier-customer incentives. 58					
	3. G. Cachon. 2003. Supply chain coordin operations research and management sc	ation with contracts. Handbooks in vience 11, 227-339.					

	<ol> <li>G. Cachon and M. Lariviere, 2005. Supply Chain Coordination with Revenue- Sharing Contracts: Strengths and Limitations. <i>Management science</i>, 47 (5), 629- 646</li> </ol>
	<ol> <li>F. Bernstein, G. DeCroix and Y. Wang. 2007. Wang. Incentives and Commonality in a Decentralized Multi-Product Assembly System. <i>Operations Research</i>, 55, 630-646.</li> </ol>
	6. Dong, L. and K. Zhu. 2007. Two-wholesale-price Contracts: Push, Pull, and Advance-Purchase Discount Contracts. <i>Manufacturing &amp; Service Operations Management</i> , 9(3), 291-311.
	7. Y. Wang, B. Niu and P. Guo. 2013. On the Advantage of Quantity Leadership when Outsourcing Production to a Competitive Contract Manufacturer. <i>Production and Operations Management</i> , 22, 104–119.
	<ol> <li>Y. Wang, B. Niu and P. Guo. 2014. The Comparison of Two Vertical Outsourcing Structures under Push and Pull Contracts. <i>Production and Operations</i> <i>Management</i>, 23, 4, 610–625.</li> </ol>
	<ol> <li>Q. Feng, L. X. Lu. 2012. The strategic perils of low-cost outsourcing. Management Science, 58(6) 1196-1210.</li> </ol>
	10. Cuihong Li and Zhixi Wan. 2015. Supplier Competition and Cost Improvement. forthcoming in <i>Management Science</i>
	<ol> <li>W. Xiao, V. Hsu and Q. Hu. 2015. Manufacturing Capacity Decisions under Demand Uncertainty and Tax Cross-Crediting. <i>M&amp;SOM</i>, 17(3), 384-398.</li> </ol>
	<ol> <li>F. Gao, X. Su. 2016. Omnichannel Retail Operations with Buy-Online-and- Pickup-in-Store, <i>Management Science</i>, Forthcoming.</li> </ol>
	13. Y Wang, W Gilland, B Tomlin. 2010. Regulatory trade risk and supply chain strategy. <i>Production and Operations Management</i> , 20 (4), 522-540.
	<ol> <li>M Schweitzer, G Cachon. 2000. Decision bias in the newsvendor problem with a known demand distribution: Experimental evidence. <i>Management Science</i>, 46 (3), 404-420</li> </ol>
	<ol> <li>T. Cui, J. Raju and Z. Zhang. 2007. Fairness and Channel Coordination. Management Science, 53(8) 1303-1314.</li> </ol>
	<ol> <li>X. Su. 2008. Bounded Rationality in Newsvendor Models, Manufacturing &amp; Service Operations Management, 10 (4) 566-589.</li> </ol>
	17. T. Ho, X. Su, Y. Wu. 2014. Distributional and Peer-induced Fairness in Supply Chain Contract Design, <i>Production and Operations Management</i> , 23(2), 161-175.
	<ol> <li>M Li, N Petruzzi, and J Zhang. 2016. Overconfident Competing Newsvendors. Management Science, Forthcoming.</li> </ol>
	<ol> <li>Y Zhang, K. Donohue and T. Cui. 2016. Contract Preferences and Performance for the Loss Averse Supplier: Buyback versus Revenue Sharing. <i>Management Science</i>, 62 (6), 1734-1754.</li> </ol>
	20. L. Yang, P. Guo and Y. Wang. Service Pricing with Loss Averse Customers. Working paper.