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Decision Systems Engineering Spring '14 Seminar Series

"Multi-Echelon Inventory Optimization under the Threat of Disruptions"

FEATURING

Larry Snyder, Associate Professor
Industrial and Systems Engineering
Lehigh University, Bethlehem, PA

Thursday, March 6th - 3:00 PM – 4:00 PM
BYENG 510

Abstract:

As supply chains have become more complex, global, and lean, their vulnerability to disruptions has increased significantly. Recent high-profile disruptions (super storm Sandy, vaccine shortages, factory fires) have captured public attention, but smaller-scale events (machine breakdowns, supplier stockouts, inclement weather) can also disrupt supply chain operations. In fact, a recent study showed that approximately 75% of companies surveyed worldwide experience disruptions in a given year. Moreover, supply disruptions are rarely localized; rather, they have a cascading effect through the system. In fact, the same study showed that over 40% of disruptions originate further upstream than the immediate supplier. Despite this, the academic literature on inventory management under the threat of supply disruptions has largely focused on single-stage inventory models derived from the EOQ, newsvendor, and other classical models. In this talk, we discuss recent work on multi-echelon inventory models. We consider fundamental network structures such as assembly and distribution systems and present properties of effective inventory policies. We also discuss heuristics for solving these inherently difficult, nonlinear problems. Finally, we discuss managerial insights that can be obtained from these quantitative models.

Bio:

Larry Snyder is an Associate Professor of Industrial and Systems Engineering at Lehigh University in Bethlehem, PA. He received his Ph.D. in Industrial Engineering and Management Sciences from Northwestern University. Dr. Snyder's research interests include modeling and solving problems in supply chain management and electricity systems, particularly when the problem exhibits significant amounts of uncertainty. His research has been published in such journals as *Transportation Science*, *IEEE Transactions on Smart Grid*, *Naval Research Logistics*, *IIE Transactions*, and *Production and Operations Management* and has been funded by NSF, state agencies, and several major corporations. He is co-author of the textbook *Fundamentals of Supply Chain Theory*, published in 2011 by Wiley, which won the IIE/Joint Publishers Book-of-the-Year Award in 2012. He has delivered or co-authored over 100 presentations at academic conferences, universities, and companies. He is a founding member of Lehigh's Integrated Networks for Electricity (INE) research cluster, an Associate Editor for *IIE Transactions*, an Advisory Editor for the Wiley Series on Operations Research and Management Science, and an Editorial Board member for *CSCMP Supply Chain Quarterly*. He is the author of a suite of freeware educational software packages including VRP Solver and BaseStockSim. For more information, visit coral.ie.lehigh.edu/~larry

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