ISYE 3232: STOCHASTIC MANUFACTURING AND SERVICE SYSTEMS

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Prerequisite: ISYE 2027

Description: Models for describing stochastic movements of jobs and materials in production and service systems. Analysis of congestion, delays, resource usage and availability, line balancing, inventory ordering policies, and system crashes. Basics of Markov chains and queueing theory.

Resources:
1. Dai, J., and Park, H., *Stochastic Manufacturing & Service Systems*, Lecture Notes.
2. Feldman, R.M., and Valdez-Flores, C., *Applied Probability and Stochastic Processes,* Second Edition, Springer, 2010.
   An electronic version is available for free at library.gatech.edu.
3. Kulkarni, V.G., *Modeling, Analysis, Design, and Control of Stochastic Systems*, Springer, 1999.
   An electronic version is available for free at library.gatech.edu.
4. Goldratt, E.M., *The Goal: A Process of Ongoing Improvement*, Third Edition, North River Press, 2004.
   An audio version is available for free at library.gatech.edu.
5. Littlefield Technologies

Course Goals: The objective of this course is to develop stochastic modeling techniques and managerial insights for the design and control of manufacturing and service systems.

Learning Outcomes: At the end of this course, students will be able to:
1. Model a system when randomness is significant.
2. Describe how variability affects a system's behavior and performance.
3. Apply Markov chains.
4. Apply basic inventory models.
5. Define key concepts in production flow such as bottlenecks, line balancing, and Little's Law.
6. Use open and closed Jackson networks.