ISE 251
PRODUCTION AND INVENTORY CONTROL
FALL SEMESTER 2019

Instructor: Dr. Xiu Yang.

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and by appointment

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Office Hours: Kangye Li: 1:30pm-3:30pm

Course Description:
An investigation of a variety of production planning, scheduling, and distribution models and systems. Heuristic, algorithmic, and analytical methodologies are explored in the context of production systems. Specific topics include job shop and Just-in-Time scheduling, forecasting, single stage and supply chain inventory control, aggregate planning, and production process variability analysis and reduction.

Course objectives:
Upon completion of this course, students will:

- know the basic operations of any production entity, including forecasting for decision-making, inventory control, production scheduling, machine scheduling, transportation planning, and aggregate planning
- be able to analyze data and from this analysis, apply models to forecast future changes for decision-making purposes
- be able to apply analytical models to solve a variety of inventory models, including those with uncertain data, lead times, economies of scale, budgets, and multiple products
- be able to sequence jobs on a machine to optimize various objectives and heuristically apply these rules to multiple machine and dynamic environments
- understand the purpose of MRP/ERP systems and their difficulties and be able to translate a bill of materials into a material requirements plan
- Understand the corrupting influence of variability in production processes and methods for dealing with it

Text:
W.J. Hopp, and M.L. Spearman, Factory Physics, 3rd Edition, Waveland Press, 2008.

Grade Determination:		
	Exams 1, 2	25 % each
	Final Exam	25 %
	Homeworks	25 %

Exam Policy:
The final exam will be given during the scheduled final exam period and will cover material over the last portion of the course, only. If any of the first 2 midterm exams is missed due to an excused absence, it will be made up at the earliest possible opportunity.

Homework:
Homework problems will be assigned throughout the semester. The lowest homework grade will be dropped. After homework is handed in, the solution will be posted.

Course Outline:

Chapter Assignments

Week	Topic	*Factory Physics*
1	Production Systems Framework	0, 1, 6, 11
1-3	Inventory Control	2
4-5	Pull Planning Framework / Forecasting	13-3
	*** Exam 1 ***	
5	Material Requirements Planning	3
6-7	Basic Factory Dynamics	7
8	Variability Basics	8
9	Corrupting Influence of Variability	9, 12.5
	*** Exam 2 ***	
10	Push & Pull Production Systems	4, 5, 10
11	Production Quota Setting	(13-4,13-5.4), (14-5,-App 14A), (15-3.2)
12	Production Scheduling	15, supplements
13	Aggregate & Workforce Planning, Capacity Management	16, 18
14	Supply Chain Management [introduction, as time permits]	17
	*** Final Exam ***	

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