IEOR 250
Introduction to Production Planning and Logistics Models
Fall 2007

Instructor:
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Office Hours:
Tuesday 11:00-12:00
Thursday 2:00-3:30
or by appointment.

GSI:
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GSI Office Hours:
To Be Determined

Course Meetings:
Tuesday 9:30-11:00 1174 Etcheverry Hall
Thursday 9:30-11:00 1174 Etcheverry Hall

Course Description:
We will explore quantitative approaches for making a variety of strategic, operational, and
tactical decisions related to production planning and control, inventory planning and control,
distribution planning, routing, scheduling, and forecasting. We will consider a wide variety of
fundamental models and algorithms that address these issues, as well as a selection of more
advanced models and algorithms that build on this fundamental knowledge. By the end of the
course, you will have a broad understanding of the fundamental approaches used in operations
management, and will be prepared to read advanced literature and take advanced courses in
this area.

Text:
A course reader is available at Copy Central (2483 Hearst at Euclid). There are some typos
and errors in the course notes – please let me know of them as you find them, and I’ll maintain
a list on the web site.

Also, the following books, on reserve in the engineering library, might prove useful:
Assignments and Grading

There will approximately bi-weekly homework assignments. Each homework assignment must be turned in at the start of class on the assignment’s due date.

There will also be a midterm and a final exam.

Final grades will be based on exam grades and homework performance.

Course Topics

I will try to cover most of the following topics, roughly in the order they are listed. The previous times I taught this class, I didn’t have time to cover the scheduling, planning, and queuing-based material that I wanted to, so I plan to eliminate some of the inventory material so I can get to this material this semester. However, please let me know if there is a particular topic listed here that you would especially like to get to.

- Inventory Theory
  - Deterministic
    * EOQ and extensions
    * Power-of-Two (Multi-Echelon, Joint Replenishment)
    * Time-varying demand
    * Capacitated Lot Sizing – Florian-Klein
    * ELSP
  - Stochastic
    * Periodic Review (Newsboy and Base Stock)
    * Continuous Review and Multi-period (S-s, Q-r)
    * Multi-Echelon (Clark-Scarf)

- Location Models
  - Center Models
- Covering Models
- Median Models
- Fixed Charged Models
- Heuristics, Lagrangian Relaxation

- Routing Models
  - TSP approximations
  - Heuristics

- Production Scheduling
  - Single Machine Models
    * Algorithms
    * Interchange arguments
  - Parallel Machine Models
    * Algorithms
    * Approximations
  - Flowshop + Jobshop
    * Shifting Bottleneck
    * Dispatch Rules
    * Critical Path scheduling
      - Heuristics for resource-constrained scheduling

- Production Planning and Control
  - MRP
  - Aggregate Planning and Techniques for Hierarchical Linkage/Disaggregation
  - Kanban, Conwip
    - Queuing-based modeling approaches