ISyE 7203

Logistics Systems Engineering

Fall 2010

Syllabus

Instructor:	Alan L. Erera Office: Groseclose 220A Office hours: TBA e-mail: Alan.Erera@isye.gatech.edu Phone: (404) 385-0358 Fax: (404) 894-2301

Class Location:	304 Groseclose
Class Times:	Tuesday, Thursday 1:35–2:55
Course Website:	http://t-square.gatech.edu

Course Objectives:

This course seeks to familiarize students with problems in the design and control of modern logistics systems, and quantitative methods for modeling, analyzing, and developing solutions to these problems. The course will introduce methods for rigorous analysis of such systems, and will provide research-level treatment of problems in the following three areas:

- local (short-haul) vehicle routing and scheduling;
- long-haul transportation resource management and service network design; and
- supply chain network planning and inventory control.

Analytical techniques and methods to be used may include

- linear and integer programming;
- local search heuristics and meta-heuristics; and
- dynamic programming and approximate dynamic programming

By the end of the course, it is expected that students will develop

- an in-depth understanding of the primary problems in logistics systems engineering, including emerging research areas; and
- the ability to develop appropriate advanced quantitative techniques for the planning and analysis of such systems;

This course is intended primarily as an introduction to research in logistics applications for Ph.D. students. As a technical elective, this course may be appropriate for Masters students with appropriate background in both operations research tools and logistics applications.

Prerequisites:

- Linear and discrete (network and integer) optimization (ISyE 6661 and 6662, or equivalents);
- Stochastic modeling (ISyE 6761, or equivalent);
- Some computer programming experience

Required Texts:

- Simchi-Levi, David; Chen, Xin; and Bramel, Julien. *The Logic of Logistics*, 2nd edition, Springer, 2005.
- Course scribe notes

Useful Reference Texts:

- Ghiani, Gianpaolo; Laporte, Gilbert; and Musmanno, Roberto. *Introduction to Logistics Systems Planning and Control*, Wiley-Interscience, 2004.
- Daganzo, Carlos, *Logistics Systems Analysis*, Fourth Edition, Springer, 2005.

Course Format:

Our study will be guided primarily by research monographs, published papers, and the Simchi-Levi text. Some material covered may also be sourced from the reference texts.

Student responsibilities in the course will include: (1) an in-class midterm examination; (2) a final examination, and (3) 1-2 weeks of scribe lecture note-taking in LaTeX. Homework problems may also be assigned periodically.

Each of these responsibilities is designed to help students prepare for Ph.D. study. The midterm will focus on computational challenges primarily, since computation is a key component in virtually all Ph.D. research in this area. The final examination will allow practice on questions similar to those to be found on the comprehensive examination. Scribe note-taking will help the student develop the ability to distill the key ideas in a lecture, and explain those ideas to fellow students.

Additional information on the detailed schedule of course topics will be distributed at the first lecture.

Grading: Grades will be assigned according to the following formula:

- Class Participation, Scribing, and Homework: 1/3
- Midterm Examination: 1/3
- Final Examination: 1/3

Academic Honor Code:

It is your responsibility to familiarize yourself with the Georgia Tech Honor Code. Specifically, you must do your own work in all homeworks, projects, and exams; when homework or projects are specifically assigned to groups, you may and should work with the other members of your group.