SIE 563 INTEGRATED LOGISTICS AND DISTRIBUTION SYSTEMS

COURSE DESCRIPTION

Plan and design of efficient logistics and distribution systems. Topics include: supply chain management, integration of production/inventory/location/transportation decisions, shipment scheduling with incomplete and uncertain information, vehicle routing and scheduling, goods distribution networks with multiple transshipment, terminals and warehouses. (Prerequisites: SIE 305, SIE 321, and SIE 540 or equivalent)

COURSE OBJECTIVE

The goal of this course is to provide students the methodology to examine production/logistics systems in an integrated way. The course will describe and show how to find rational structures for logistics systems considering all the relevant aspects. Building on an understanding of the simplest logistical system with only one origin and one destination, the course explores problems with many origins and many destinations. The solutions and methodologies presented in the course are particularly helpful in instances where detailed data are not available and when time is of the essence. The course will emphasize in the three categories of knowledge pertinent to logistics systems: 1) relationship between production, inventory and transportation systems; 2) model development and evaluation in logistics systems; and 3) logistics system design.

TOPICS
- Characterization of costs: transportation costs, holding costs, and handling costs.
- Stochastic effects (public carriers and two shipping modes)
- Lot size problem with constant and variable demand
- One-dimensional location problems
- Optimization: the continuous approximation approach
- Accuracy issues in the CA method
- One-to-one distribution
- One-to-many distribution: fixed vs. variable vehicle loads
- The VRP approach vs. non-detailed routing
- One-to-many distribution with transshipment
- Multiple transshipment
- Many-to-many distribution: Break-bulk role of terminals
- Design of logistics networks

REQUIRED TEXTBOOK

Carlos F. Daganzo: Logistics Systems Analysis, 4th Ed. Springer, 2004 and course notes.

COURSE EVALUATION

The following weighting system will be used in the course:
- Homework …………. 50%
- Mid Term …………………20%
- Final Project ..…………….. 30%