ISM 125/205: Management of Technology II: Supply Chain Management

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Lecture Times: Tuesday/Thursday, 12 – 1:45 PM
Location: Physical Sciences Building, Room 114
Office Hours: Tuesday, 3:30 – 6:30 PM

About the course:
ISM 125/225 MOT II, Supply Chain Management, is the second in a sequence of courses in the management of technology.

The first course MOT I focused first on the development of the market for a product and then on the development of the product itself. To these ends MOT I, provides a systematic methodology and the corresponding set of methods and analytical tools to address the management, development and commercialization (MDC) of technology and products in an integrated manner.

MOT II focuses on the design and design and development of the value and supply chain network for the product from suppliers through manufacturer all the way to the end-customers. To these ends MOT II will develop and apply methods and tools for the management, design, optimization, and operation of these value/supply chain networks. ISM 225 requires two additional topics (Pricing, Resource Allocation) and a more comprehensive team project.


Course Prerequisites: Math 19A, 19B; Probability and Statistics; strong working knowledge of Excel: we will be using extensively the optimization package Solver which is part of Excel.

Objectives of the course:
• To understand the stages, processes, and flows involved in the strategic design, planning, and operation of enterprise value and supply chains.
• To develop and apply an integrated framework for designing, planning, and operating a supply chain.
• To develop and apply methods and tools for effective and efficient management of supply chains. These tools will be both qualitative and quantitative in nature.
• To gain experience with SCM of high-tech products through case studies and the term project.
• To design and implement a SCM software system for simulating an integrated enterprise supply chain (as part of the term project).

Grading:
• Homework: 25%
• Project: 25%
• Midterm Exam (Feb. 3): 25% (Take-home)
• Final Exam (Mar10): 25% (Take-home)
Project Plan: (dates indicate when progress reports are due)
- Form project teams and choose technology domain by 1/6
- Formulate Project Proposal: due 1/11
- Phase 1 (Technology/Product Strategy and SC Strategy/Design): due 1/18
- Phase 2 (Supply Chain modeling and planning; demand forecasting): due 2/1
- Phase 3 (Supply Chain operations: inventory, transportation, and facilities): due 2/15
- Phase 4 (The software information system for the Supply Chain; simulation) due 3/1
- Phase 5: Closure and Final Report: due 3/8

General Comments:
- This course is interactive. We will be actively discussing case studies and homework in class. Therefore, attendance is mandatory.
- Homework must be turned in on time. This is really to prevent the “bullwhip effect” (see chapter in the textbook on “Coordination”, and also the section on the “Beer Game”)
- If you have any problems related to the course, please inform me immediately so that we can resolve the issue quickly.

Course Topics (D/S = Design/Strategy; P = Planning; O= Operations):

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<tr>
<th>Topic</th>
<th>Methodology/Tools</th>
<th>Examples or Case Study</th>
<th>Text Chapter*</th>
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<td>Introduction to SCM</td>
<td>Stages, Cycles, Flows, IT</td>
<td>Dell, Toyota</td>
<td>1, 16.1, 16.2</td>
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<td>D/S 1: Supply Chain Performance and Drivers</td>
<td>Strategic fit between competitive strategy and Supply Chain strategy</td>
<td>Dell, Toyota</td>
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<td>P1: Demand Forecasting in a SC</td>
<td>Time Series Forecasting methods</td>
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<td>P2: Managing economies of scale in an SC</td>
<td>Cycle Inventory control</td>
<td>Moonchem, Dell, Toyota</td>
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<td>P3: Managing Uncertainty</td>
<td>Safety Inventory control</td>
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<td>P4: Optimal Product Availability</td>
<td>Optimization</td>
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<td>12.1-12.3</td>
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<td>P5, O1: Transportation</td>
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<td>D/S 2: Supply Chain Network and Facilities Design</td>
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<td>Supplier Assessment/Scoring</td>
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<td>O2: Coordination in a SC</td>
<td>“Bullwhip Effect”</td>
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<td>D/S 4: Information Tech.</td>
<td>IT Architecture</td>
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<td>D/S 5: (ISM 225 only) Pricing</td>
<td>Optimization</td>
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<td>P6: (ISM 225 only) Aggregate Planning</td>
<td>Linear Programming</td>
<td>SPC, Kodak</td>
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*(Chapter Numbers refer to the Third Edition [2007] of the textbook)