SYLLABUS FOR - IE 659 Supply Chain Engineering  
(Fall 2012 Classroom Section)

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Tel: (973) 596-3654

COURSE DESCRIPTION

Supply Chain Management focuses on managing material and information flows across the product delivery enterprise. This course focuses on the key operational capabilities that a supply chain system must develop to support the business strategy of a firm, and the relationship between the desired capabilities and the structure of a supply chain. We define supply chain structure in terms of the following drivers of performance: facilities, inventory levels, logistic networks, information flow processes and data analytics. Students will gain exposure to quantitative methodologies and analysis that support operations and supply chain strategy and planning decisions, using case studies and development of analytical spreadsheet models.

MOODLE

The course will make extensive use of the Moodle system to optimize student-instructor communication. All course materials including lecture slides and homework etc. will be distributed through Moodle. All submission of homeworks and other assignments will also be through through Moodle. To access the system please got to http://moodle.njit.edu, you will need a valid UCID to login.

GRADING

Based in individual and team performance as follows:

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<th>Homework #1</th>
<th>25% Midterm Exam</th>
<th>20% Case Study Project</th>
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<th>%</th>
<th>Homework #2</th>
<th>25% Final Exam</th>
<th>5% SAP Exercises</th>
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LECTURE SLIDES AND SUGGESTED READINGS

IE 659 Supply Chain Engineering lectures slides by Prof. Sanchoy Das will be distributed electronically through Moodle

**Course Readings** – Several papers (R1 to R8) have been selected to complement the weekly topics. These are listed below, please complete each reading prior to the start of the topic.

**SAP Manuals** – This course only introduces the supply chain associated modules in the SAP domain. To support you further education of SAP capabilities we provide you with a set of manuals describing the functionality of these modules. You are expected to read those on your own initiative.

**CASE STUDY TEAM PROJECT:**

The case study project will be completed in teams of four students. Each team will be assigned a unique case study from the textbook. The team is required to review and discuss the assigned case and create a detailed PowerPoint report which focuses on given team tasks. Each team will make a 15 minute presentation to the class on their case. Presentations will be scheduled for each team on the scheduled dates (see below). A detailed instruction sheet for the team project will be distributed at a later date.

**COURSE OUTLINE**

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**SECTION-1: Modeling Perspective**

**1. 1, 2, 3**  
*Introduction to Supply Chain Management*  
- Understanding the Supply Chain and its Challenges  
- Supply Chain Performance Metrics and Strategic Objectives  
- Example Modern Supply Chains: Wal-Mart, Home Depot, McDonald’s

*Lecture #1: Introduction to Supply Chain Management*  
*Video: V1. Whirlpool Appliance Supply Chain*  
*Reading: R1. Global Survey Of Supply Chain Progress*

**2. 4, 5**  
*Network Flow Optimization*  
- Distribution Network Basics  
- Logistics Networks Design – LP Solution by Excel Solver

*Lecture #2: Network Flow Optimization*  
*Video: V2. Ford Motor Europe Spare Parts Distribution*  
*Reading: R2. Best Value Supply Chains*

**3. 7, 9**  
*Demand Planning in Supply Chains*  
- Demand Management Objectives  
- Forecasting Tools: Moving Average & Linear Regression  
- CPFR (Collaborative Planning, Forecasting & Replenishment)  
- The Bullwhip Effect
Lecture #3: Demand Planning in Supply Chains  
_Video:_ V3. Sleep Better with SAP: Hastens Implementation  
_Reading:_ R3. The Global Enterprise: Where China Fits Now

_HW# 1Assigned on 9/27/12 - Submit on 10/9/12_

4. 11, 12  
**Inventory Control Models**  
- The Role & Cost of Inventory in the Supply Chain  
- Economic Order Quantity Models and Extensions  
- Reorder Point Inventory Systems  
- Newsvendor Inventory Problem  
- N-Store Retail Supply Chain

_Lecture #4A: Inventory Control in Supply Chains_  
_Lecture #4B: Uncertainty & Risk in Inventory_  
_Video:_ V4. SAP at Salvatore Ferragamo  
_Video:_ V5. SAP Demo Collaborative Demand and Supply  
_Reading:_ R4. What is the Right Supply Chain  
_Reading:_ R5. Rapid Fire Fulfillment at Zara

5.  
**MIDTERM EXAM (Thursday, Oct 18, 2012)**

SECTION-2: Enterprise Perspective

6.  
**Materials Requirements Planning (MRP)**  
- MRP Planning Model  
- Advanced Lot Sizing Methods

_Lecture #5: Materials Requirements Planning_  
_Video:_ V6. Keeping the Global Supply Chain Moving  
_Video:_ V7. David's Bridal Supply Chain  
_Reading:_ R6. Supply Chain Game Changers

7. 15, 16  
**Supplier Relationships & Contracts**  
- Supply Contracts & Sourcing Flexibility  
- Revenue sharing models & Buyback contracts  
- Vendor Managed Inventory

_Lecture #6: Supplier Selection & Supply Contracts_  
_Video:_ V8. SAP Demo Efficient Manufacturing Operations  
_Reading:_ R7. Triple-A Supply Chain Revisited

_HW# 2 Assigned on 11/8/12 - Submit on 11/20/12_

8.  
**Supply Chain Performance Data Analytics**  
- Performance Evaluation Metrics  
- Supply Chain Scoreboard  
- The MIT Beer-Supply Simulation Game (12/6/12)
SAP University Alliance Modules:
(i) SAP Business Objects BI OnDemand

Lecture #7: Supply Chain Performance Analytics
Video: V9. Cognos Business Intelligence Overview
Reading: R8. SAP APO Steel Planning Example

9. 17

Information Technology & ERP in Supply Chains
- Introduction to ERP Systems and their Modules
- Introduction to SAP Modules
- SAP Supply Chain Management

SAP University Alliance Datango Simulator Modules:
(i) ERP Navigation
(ii) ERP Setup and SCM Navigation
(iii) Purchasing Process

Lecture #8: Enterprise Resource Planning Systems
Lecture #9: Introduction to SAP SCM 7.0
Video: V10. The World is Flat
Reading: R9. Gartner Top 25 Supply Chains


11. FINAL EXAM (12/20/2012)