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

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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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|-----|-------------|-----|--------------|-----|--------------------|
| 12% | Homework #1 | 25% | Midterm Exam | 20% | Case Study Project |
| 13% | Homework #2 | 25% | Final Exam | 5% | SAP Exercises |

LECTURE SLIDES AND SUGGESTED READINGS

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

Supply Chain Management: Strategy, Planning, and Operations, by Sunil Chopra and Peter Meindl, Prentice Hall, 5th Edition, ISBN-10: 0132743957

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 your 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

| # | CHAPTER | TOPIC |
|---|---------|-------|
|---|---------|-------|

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# 1 Assigned 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

10. **Team Project Presentations** (11/8/2012 and 11/29/2012)

11. FINAL EXAM (12/20/2012)
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