

Fall 2019

IE 659-101: Supply Chain Engineering

Art Ismail Yagci

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SYLLABUS FOR 19 F - IE 659101-Supply Chain Engineering

Instructor: Art (Ismail) Yagci, PhD

Class Room: Guttenberg Info Tech Center 2305 | Office hours: Thursday's (30 minutes before/after class time)

Email: iay2@njit.edu

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. This course explores the key issues associated with the design and management of industrial Supply Chains (SC). A SC is concerned with the efficient integration of suppliers, factories, warehouses and stores so that products are distributed to customers in the right quantity and at the right time. One of the primary objectives of SC management is to minimize the total supply chain cost subject to various service requirements. Students will be able to describe and explain fundamentals of SC and to derive and compute optimal policies/variables, performance measures such as costs/profits, and be aware of SC practices. 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 homework and other assignments will also be 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: 17% Homework #1 25% Midterm Exam 16% Case Study Project 17% Homework #2 25% Final Exam

LECTURE SLIDES AND SUGGESTED READINGS

IE 659 Supply Chain Engineering lectures slides by Prof. Ismail Art Yagci will be distributed electronically through Moodle

Supply Chain Management: Strategy, Planning, and Operations, by Sunil Chopra and Peter Meindl, Prentice Hall, 6th Edition, ISBN-978 0133 800 203

Course Readings – Several papers/reports (R1 to R9) have been selected to complement the weekly topics. These are listed below, please complete each reading prior to the start of the topic.

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CASE STUDY TEAM PROJECT:

Your team (4 members) has been asked to review and discuss the assigned case study and create a 14-18 slide powerpoint report. Teams will be assigned projects during one of the class lectures. All case studies are taken from the course textbook and are listed below, the specific page numbers are also given. Your powerpoint report should be organized into the following general sections: (i) problem overview and case back ground (ii) available and market data or trends that you think are relevant to the case study and (iii) your proposal to management for answering the questions. The last slide must explicitly list your recommendations to management. The questions associated with each case study are listed at the end of the case study. You must attempt to address all the questions, but may opt to concentrate on some questions relative to others. To distribute the case study presentations there will be 2 presentation dates listed in the course outline. I will arbitrarily assign dates to each team. You must upload your final presentation report on Moodle by 11/4/2019. Each team will deliver their analysis and discuss their project with the class through a powerpoint presentation (15 minutes). Your team grade will be based on (i) the presentations and the final PowerPoint report – 80% and (ii) the Q&A role as the executive team – 20%.

Tips for creating a good case study presentation report. 1. Investigate and Analyze the Company's Background. 2. Identify Strengths and Weaknesses Within the Company 3. Gather Information on the External Environment 4. Analyze Your Findings 5. Identify Financial Level Strategy. 6. Identify Operational Level Strategy. 7. Analyze Possible Solutions and their Implementations 8. Make Recommendations. The final part of your case study analysis should include your answers and recommendations. Every recommendation you make should be based on and supported by the context of your case study analysis.

COURSE OUTLINE

#	CHAPTER	Date	TOPIC
SECTION-1: Modeling Perspective			
1	1,2,3	Sep 5, 2019	Introduction to Supply Chain Management - Supply Chain Strategic Goals - Supply Chain Performance Metrics and Strategic Objectives

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			<p>- Example Modern Supply Chains: McDonalds and Home Depot</p> <p>Lecture #1: Introduction to Supply Chain Management Video: V1. Adidas Omni-Channel Shopping Video: V2. Managing the Value Chain: Agents of Change Reading: R1. Digitization Makes the Supply Chain More Efficient</p>
2	4,5	Sep 12, 2019	<p>Network Flow Optimization</p> <p>- Distribution Network Basics - Cross Docking Operations - Configuration of Logistics Networks - Logistics Networks Design – LP Solution by Excel Solver Lecture</p> <p>#2: Network Flow Optimization Video: V3. General Mills Global Sourcing Video: V4. Grupo Arcor Oracle Demand Management Reading: R2. Best Value Supply Chains</p>
3	7,9	Sep 19, 2019	<p>Demand Planning in Supply Chains</p> <p>- Demand Management Objectives - Forecasting Tools: Moving Average & Linear Regression - The Bullwhip Effect</p> <p>Lecture #3: Demand Planning in Supply Chains Video: V5. Sleep Better with SAP: Hastens Implementation Video: V6. Starbucks Global Supply Chain Reading: R3. SAP Demand Sensing & Shaping</p> <p>HW# 1 Assigned on 9/26/2019 - Submit on 10/10/2019</p>
4	11,12	Sep 26, 2019	<p>Inventory Control Models – Certain & Uncertain</p> <p>- The Role & Cost of Inventory in the Supply Chain - Economic Order Quantity Models and Extensions - Reorder Point Inventory Systems - Newsvendor Inventory Problem - Risk Pooling: Centralized Inventory</p>

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			<p>Lecture #4A: Inventory Control in Supply Chains Lecture #4B: Uncertainty & Risk in Inventory Video: V7. SAP at Salvatore Ferragamo Video: V8. Vera Bradley Operations Video: V9. Zara Fast Fashion Reading: R4. Fresh Express: Six Day Perishable Supply Chain Reading: R5. Rapid Fire Fulfillment at Zara</p>
5		Oct 3, 2019	MIDTERM EXAM
SECTION-2: Enterprise Perspective			
6		Oct 10, 2019	<p>Materials Requirements Planning (MRP) - Bill of Materials & Process Plan - MRP Scheduling Algorithm - Advanced Lot Sizing Methods</p> <p>Lecture #5: Materials Requirements Planning Video: V10. Logistics for an Omni-Channel World Video: V11. Lennox International - Supply Chain Integration Reading: R6. Supply Chain Game Changers</p>
7	15	Oct 17, 2019	<p>Sourcing Decisions & Supplier Contracts - Supply Contracts & Sourcing Flexibility - Revenue Sharing Models</p> <p>Lecture #6: Supplier Selection & Supply Contracts Video: V12. SAP Business One Demo - Inventory Reading: R7. Driving Supply Chain Excellence</p>
8	16	Oct 24, 2019	<p>Supply Pricing & Revenue Management - Pricing to Multiple Segments - Perishable Assets Dynamic Pricing - Supply Chain Analytics - Gartner Top 25: Metrics and Findings</p> <p>Lecture #7: Supply Pricing & Revenue Management</p>

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			<p>Video: V13. Lifetime Brands Makes Home Products Better with SAP</p> <p>Video: V14. Future Supply Chain 2016 – Cap Gemini</p> <p>Reading: R8. Gartner Supply Chain Top 25 – LlamaSoft Analysis</p> <p>HW# 2 Assigned on 11/7/2018 - Submit on 11/14/2018</p>
9		Oct 31, 2019	<p>Fast Fulfillment & Online Retail Supply Chains</p> <ul style="list-style-type: none"> - The Amazon Fulfillment Warehouse - Online Fulfillment Key Differentiators - Analytics driven decision models <p>Lecture #8: Fast Fulfillment – The Machine that Changed Retailing</p> <p>Reading: R9. Product Flows & Models in Internet Fulfillment Warehouses</p>
10	17	Nov 7, 2019	<p>Information Technology & ERP in Supply Chains</p> <ul style="list-style-type: none"> - Introduction to ERP Systems and their Modules - Introduction to SAP Modules - SAP Supply Chain Management <p>Lecture #9: Enterprise Resource Planning Systems</p> <p>Lecture #10: Introduction to SAP</p> <p>Video: V15. SAP Business One</p> <p>Video: V16. SAP Strategic MRP Monitor</p> <p>SAP Learning Resources</p> <ol style="list-style-type: none"> 1. SAP-SCM Tutorial: https://www.tutorialspoint.com/sap_scm/sap_scm_tutorial.pdf 2. SAP-SCM Overview Slides 3. SAP Material Management (MM) Training Video https://www.youtube.com/watch?v=X8Q6lJi-MuY

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			4. SAP-MM Certification https://sap-certification.info/mm/
11		Nov 14, 2019	Team Project Presentations
12		Nov 21, 2019	Team Project Presentations
13		TBD: between Dec 14, 2019 and Dec 20, 2019	FINAL EXAM (Check NJIT Final exam schedule)