

SCM 7330 (23113)
Demand and Supply Integration
Spring 2017
Bauer College of Business; University of Houston
Department of Decision and Information Systems

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Class Time: Monday 6:00-9:00pm MH130
Office Hours: Monday 4:00-5:45pm (or by appointment).

COURSE DESCRIPTION

Supply chain management is the integrated management of the flow of materials, products, services, and cash from the suppliers all the way to the customers and often from the customers back to the suppliers. Due to the large-scale and complex nature of supply chains, effective management of these flows is a challenging task and requires integration within the firm and across the supply chain. This is often referred to Demand-Supply Integration, where the challenge is to balance the customers' demand characteristics with the supply chain's capabilities for providing product. This is accomplished by strategically managing both the customer's demand characteristics and supply chain processes. This requires a deep understanding of a firm's distribution and manufacturing planning and control (DMPC) systems (which are embedded in Enterprise Resource Planning (ERP) systems in a great number of organizations) and how they can be tailored to provide competitive advantage.

COURSE OBJECTIVES

This course provides an understanding of the strategies and techniques used to obtain demand and supply integration. Specifically, the focus is on (1) the components comprising the DMPC and their integration and (2) alternative strategies for balancing demand and supply.

COURSE TEXTBOOK AND OTHER MATERIALS

Textbook: *Manufacturing Planning and Control for Supply Chain Management- APICS/CPM Certification Edition* by Jacobs, F. R., Berry, W. L., Whybark, D. C. and Vollmann, T. E. (2011). ISBN 978-0-07-175031-8

Case studies: There is a course page created on Harvard Business Online for you, where you can access the cases required for the course. The link is listed below:

<http://cb.hbsp.harvard.edu/cbmp/access/59332759>

You will have to register with Harvard Business Online to get access to the cases the easiest and the least expensive way.

STRUCTURE OF THE COURSE

This course meets only once per week. Hence, every session is important. In class activities will be designed to explain the material covered by the cases and readings. However, in class activities only enhance the materials found in the texts, not replace them. You must read the assigned course material!

Suggested problems, quizzes, case studies and examinations provide an opportunity to apply the concepts developed in course and demonstrate knowledge of the material.

GRADES

A 100 point scale is used for this course. Grades will be made up of the following items:

Mid-term Examination: In-class examination which measures the mastery of the course material. All exams will be closed book and closed notes. The exam will cover all material from lectures, readings, videos, exercises, study problems, etc. Each student will be allowed to use a regular calculator during the exam. Cell phones cannot be used instead of calculators. The exam format will be a combination of short problems, short answers and/or multiple choice questions.

Final Examination: In-class examination which measures the mastery of the course material. Each student will be allowed to use a regular calculator during the exam. The exam format will be a combination of short problems, short answers and/or multiple choice questions. This exam draws on all material covered in the class. However it draws primarily on material covered after the Mid-term Examination.

Quizzes: There will be several announced/unannounced quizzes during the semester. Each will entail knowledge of materials already assigned or discussed in class. The student should be prepared for a quiz over the assigned material each day. Preparing notes on discussion questions, working suggested problems and reviewing material from previous class will enhance performance on the quizzes. At the end of the semester, the lowest quiz grade will be dropped. If a student misses a quiz (e.g. for illness, job related reasons, job interview or any other circumstances), that quiz will count as your lowest quiz grade and will be dropped at the end of the semester.

Case Analysis: Each student will be assigned to a team for case analysis. The team will prepare the case for in class presentation and present their analysis in class. The presenting team should provide copies of the power point slides and other relevant material to the professor at least 24 hours prior to the in-class case presentation.

In Class Performance: I view each class meeting as a business meeting. During this time the course material and topic will be discussed. Each student is expected to actively participate during class meetings. Your contributions toward advancing the class' understanding of the course material provide the basis for your in-class performance grade. The quality of one's contributions versus the quantity of contributions weighs more heavily in demonstrating a high level of in class participation. Insightful analysis of the day's topics is a plus. Class attendance alone does not indicate in-class performance—you must make a contribution to class learning.

| Grade Calculation: | <u>Percentage</u> |
|-------------------------------------|-------------------|
| Mid-term Examination | 30% |
| Final Examination | 30% |
| Case Analysis | 15% |
| In-class performance | 10% |
| Quizzes (Announced and Unannounced) | <u>15%</u> |
| Total | 100% |

In determining the final course grade, the following scale is used to convert points into letter grades:

| | | | |
|------|------------|------|-----------|
| A = | 93 - 100 % | C+ = | 78 - 79 % |
| A- = | 90 - 92 % | C = | 70 - 77 % |
| B+ = | 88 - 89 % | D = | 60 - 69% |
| B = | 80 - 87 % | F = | 0 - 59% |

MAKE-UP EXAM POLICY

The syllabus contains the dates of the examinations so that you can schedule your other activities around these dates. If a major exam is to be missed due to an approved university absence, you should inform the instructor as soon as possible prior to the exam (if not possible, no later than 24 hours after the exam). A make-up exam will then be scheduled as soon as possible. The make-up exam will cover all the material presented up to the date of the make-up exam. The format of the exam may be different than the original exam format.

GENERAL POLICIES

As students enrolled in courses offered by the Bauer College, you are expected to adhere to the ethical principles described in the Bauer Code of Ethics and Professional Conduct (Bauer Code), in addition to those required by the UH Student Handbook. You may review the Bauer Code by clicking on the following link - <http://www.bauer.uh.edu/BCBE/BauerCode.htm>. You may obtain a copy of the UH Student Handbook from the Dean of Students Office located in room 252 of the University Center, or by visiting the publications webpage on the Dean of Student's website at <http://www.uh.edu/dos/pub.html>.

1. **Timely Arrivals and Departures:** It is expected that you arrive on time and prepare to leave after class has been dismissed.
2. **Office Hours:** I will have regularly scheduled office hours. If for some reason you need to meet at an alternate time, please contact me so we can make arrangements to meet. You are encouraged to contact the professor at the first sign of any problem or lack of understanding. Do not wait until it is too late!
3. **Technology in class:** It is expected that you provide full attention during class. Please turn your cell phones and beepers off before coming to class. Also, please note that computer use and Internet network access is not granted during class. If the instructor decides to grant access at any point throughout the semester, it is not for the purpose of 'surfing the Web', 'checking e-mails' or instant messaging during class times is not allowed as this behavior is unprofessional, and fails to meet the standards of the business program. The sole purpose of allowing Internet access (if allowed) during class times (when necessary) is to enhance the overall learning environment by providing electronic access to relevant class related material.
4. **Study Groups:** I strongly encourage students to form study groups for the course. This will provide a resource for information should you miss class, a venue for discussing assignments, and a study group for exams.
5. **Blackboard:** Course materials, announcements, grades or changes to the course outline will be posted on Blackboard Learn. It is the student's responsibility to check Blackboard before every class period for important announcements, class notes, emails, grades and changes to the course schedule.
6. **Academic Dishonesty:** Scholastic Dishonesty is defined as (1) Acquiring or attempting to acquire information from others (e.g., observing the work of others during an exam), (2) Providing others with information on quizzes/exams; (3) Plagiarism, (4) Conspiracy to commit any of the above, (5) Fabrication of information. The University of Houston honor code statement applies to all students in this class. For more information, see Bauer Academic Honesty on <http://www.bauer.uh.edu/current/academic-honesty.asp>. Any student caught providing or receiving assistance on an exam/quiz/case study will immediately be given a grade of "F" for the course.
7. **Students with Disabilities:** Any student who feels s/he may need an accommodation based on the impact of a disability should contact the professor privately within the first two weeks of classes to discuss his/her specific needs. The student also needs to contact the Center for Students with Disabilities (contact information is below) within the first two weeks for coordinating accommodations.

Justin Dart Center for Students with Disabilities
CSD Building #568, Room #110, University of Houston, Houston, Texas 77204-3022
Phone: (713) 743-5400; TDD: (713) 749-1527

HAVE A GREAT SEMESTER!

Tentative Course Schedule and Topics

Jan 23: Course Overview and Introduction to Demand-Supply Integration

1. Learn by Case Method
2. "The Battle for Supply Chain Talent", Henry Canitz-Supply Chain Digest, January 12, 2017.
3. In-Class Reading: "Exclusive: Roosters' Fertility Problem Hits US Chicken Supply, Lifts Prices".
4. Chapter 1: Manufacturing Planning and Control, pages 1-12.
Discussion Questions:
 - a. What are the typical tasks performed by the MPC system and how do these tasks affect company operations?
 - b. What are the key MPC components and how do they respond to a company's needs?
 - c. How do supply chain product- process issues affect MPC system design?
 - d. What forces drive changes in the MPC and how do companies respond to forces?

Supply Chain Strategy

1. Case: Seven-Eleven Japan Co.

Discussion Questions:

- a. What is Seven-Eleven's supply chain strategy?
- b. How is Seven-Eleven's supply chain structured?
- c. Is the structure matching the strategy?

Jan 30: Supply Chain Strategy

1. "What is the Right Supply Chain for Your Product?". Fisher, Marshall. *Harvard Business Review*. March/April 1997, p105-116."

Discussion Questions:

- a. What are the basic differences between functional and innovative products in terms of demand characteristics and the features of the supply chain that is best suited for each product type?
 - b. How does the 'Matrix' on page 109 help a company evaluate their supply chain?
- ### 2. "Making Supply Meet Demand in an Uncertain World". Fisher, Marshall; Hammond, Janice H., Obermeyer, Walter, R. and Raman, Ananth. *Harvard Business Review*, May/June 1994, 83-93.

Discussion Questions:

- a. What are the two basic elements of accurate response approach that make accurate response different from traditional forecasting and scheduling systems?
 - b. How does Sport Obermeyer deal with demand uncertainty? What strategies do they follow in dealing with it?
- ### 3. "When One Size Does Not Fit All." Simchi-Levi, David; Clayton, Annette; Raven, Bruce. MIT Sloan Management Review. Winter 2013, Vol. 54 Issue 2, p15-17

Demand Management

1. Chapter 3: Demand Management, pages 45-70.

Discussion Questions:

- a. Explain the components of Manufacturing Planning and Control Systems and how they relate to demand management. (see Figures 1.1 and 2.1)
- b. What is the difference between "planning" and "execution" phases of demand management?
- c. The "customer order decoupling point" can be looked at as the point at which demand changes from independent to dependent demand. Explain what this means and why it is important?
- d. How do MTS, ATO and MTO relate to the customer order decoupling point?
- e. Collaborative Planning, Forecasting, and Replenishment (CPFR) attempts to improve communications between customers and suppliers in forecasting product demand. How does it work?

Feb 6: Forecasting and Planning for Medium and Long-Term Demand

1. Chapter 4, Medium and Long-Term Forecasting Techniques, Simple Regression Analysis, pages 75-91; 98-99.
2. Forecasting Problem Set: Medium-Term Forecasting: (Problems to be assigned.)
3. See the following websites to see how leading economic indicators can be used in medium/long term forecasting.
<http://www.census.gov/economic-indicators/>

Feb 13: Forecasting and Planning for Medium and Long-Term Demand (Continued)

1. Forecasting Lecture Notes: Medium and Long-Term Forecasting
2. Pyramid Forecasting, pages 99-105.
3. Reading- "Why Forecasts Fail? What To Do Instead?" Makridakis, Sypros; Hogarth, Robin M.; Gaba, Anil. MIT Sloan Management Review. Winter 2010, Vol. 51, Issue 2, 83-90.
4. Reading-"Creating Demand-Responsive Supply Chains", Yossi Sheffi, Harvard Business Publishing Newsletters, Supply Chain Strategy, April 1, 2005.
5. Reading-"Just In Time for the Holidays". Eric McNulty. Harvard Business Review Case Study. December 2005, P.39-49.

Case: Managing with Analytics at Procter & Gamble

Discussion Questions:

1. Describe P&G's restructuring initiative including, objectives and the four independent global organizations. What did they hope to achieve?
2. How did Passerini structure the Global Business Services (GBS) organization with respect to Information Technology? What role did centralizing GBS and keeping IT activities in-house play?
3. Describe objectives and characteristics of the Information and Decision Solutions (IDS) group. How did IDS support the Global Business Units (GBU)?
4. Describe the forecasting and Business Sufficiency Models developed by IDS. How are they applied? What impact did they have on P&G's culture?
5. What advice can you provide Alan Torres with respect to detergent forecasts and the planned roll-out of the compacted detergents?

Feb 20: Managing Inventory: Order Quantity and Reorder Point Systems

Reading: Solving the Out-of-Stock Problem (Reading posted on Blackboard).

Managing Inventory: Fixed Time Period Models, Continuous Review Models, Determining Inventory Customer Service Levels

Chapter 16: Order Point Inventory Control Systems, pages 469-493.

Feb 27: Managing Inventory: Order Quantity and Reorder Point Systems (Continued.)

Managing Inventory Incremental Analysis and the Newsvendor Model

1. Lecture Notes: Newsvendor Model

Demand and Supply Integration in Practice

Case: L.L. Bean, Inc.

Discussion Questions:

1. How does L.L. Bean use past demand data to determine how many units of an item to stock?
2. What item costs and revenues are relevant to the decision of how many units of the item to stock?
3. What information does Scott Sklar need to help him arrive at a demand forecast for a particular style of men's shirt that is a new catalog item?
4. How would you address Mark Fasold's concern that the number of items purchased usually exceeds the number forecast?
5. What should L.L. Bean do to improve its forecasting process?

March 6: Revenue Management

1. Lecture Notes and Readings to be announced/posted on Blackboard.

Discussion Questions:

- a. What is the basic objective of Revenue Management?
- b. What are the basic assumptions underlying Revenue Management?
- c. What are the benefits/drawbacks of Revenue Management to the firm? Customer? Examples.

March 13: No Class-Spring Break

March 20: Examination 1 (Please bring a calculator to exam; cell phones cannot be used for calculators. Equations will be provided.)

March 27: System Dynamics: Beer Game

1. Beer Game (Please bring your computers to class in order to play the Beer Game).
2. Bullwhip Effect: "A Pain in the (Supply) Chain", *Harvard Business Review Case Study*, May 2002, p. 31-37.

Discussion Questions:

- a. What are the problems that Exceso is experiencing as a result of its promotion strategy?
 - b. Should Exceso maintain its aggressive promotion strategy? What are the implications of its strategy? What would be your advice to Exceso in dealing with the problems it's experiencing?
3. Reading- "China's Slowdown: The First Stage of the Bullwhip Effect.", Yossi Sheffi, *Harvard Business Review*, September 9, 2015.

Sales and Operations Planning

1. Chapter 5, Sales and Operations Planning, pages 115-142

Apr 3: Master Production Scheduling (MPS)—Determining how much to make of each item.

1. Chapter 7, Master Production Scheduling
2. MPS Problem Set

Apr 10: Material Requirement Planning (MRP)—Getting the right part at the right time to support the MPS

1. Chapter 8, Material Requirements Planning
2. MRP Lecture Notes
3. MRP Problem Set

Apr 17: Distribution Requirements Planning (DRP)

1. Chapter 14, Distribution Requirements Planning, 403-428.
2. DRP Lecture Notes
3. DRP Problem Set

Apr 24: Team Case Presentations

Case: The Morrison Company

1. Identify and assess the operations problems occurring at the Morrison Company.
2. Explain the differences between the production processes for the pharmaceutical product line compared with those of the retail product line. Why are they different?
3. What recommendations would you offer Shauna Breen about how to address these issues? Be specific about any policies or organizational changes you propose.

Case: Playa Dorada Tennis Club: Expansion Strategy

1. What is the dilemma facing Douglas Hall? What are his options?
2. How many tennis courts will be needed in March 2007 and April 2007? In March 2008 and April 2008? (Assume the growth rate stays the same.) How does that requirement compare to present capacity?
3. What should Douglas Hall do for the coming season? For next year?
4. What are the implications for future of tennis at PD Resort?

Case: Scientific Glass, Inc: Inventory Management

1. What are the problems facing SG in January 2010?
2. How much external funding will have to be raised in 2010 in order to finance the operations?
3. How do SG's problems illustrate the relationship between the number of warehouses and inventory levels?
4. What alternatives are available for dealing with the inventory problems? How would you evaluate the alternatives?
5. What actions should Ava Beane propose to Eric Gregory and Melissa Hayes?

May 1: Team Case Presentations (continued)

Case: Foldrite Furniture Co.: Planning to Meet a Surge in Demand

1. What recommendations would you make to Martin Kelsey in February 2010? Be specific and provide support for your recommendations. These recommendations should be suitable for presentation to upper management at Foldrite.

Case: Cataumet Boats, Inc.

1. What is the overall goal of aggregate production planning (APP)?
2. How might Cataumet Boats benefit from APP?
3. What are the potential risks/rewards of using APP? What assumptions are made?

4. What are the major constraints in Cataumet's business?
5. Determine the total labor hours for all of the various tasks that are typically required to be completed over a year. Assume an average time for each task in which there is variability among completion time. How does this compare to the total labor hours that are currently available, not including the seasonal workers that are hired in the spring?
6. Given that the owners want to maintain the current full-time workforce of 11, calculate the costs of the following aggregate plans for both fall and spring:
 - a. Schedule the full-time workers for overtime up to a maximum of 60 hours a week.
 - b. Schedule the full-time employees for only 40 hours a week and hire seasonal workers to do the additional work needed to meet customer demand.
 - c. Level-load the work during the peak demand periods for fall and spring, and hire seasonal workers to meet the excess demand.
7. To address Uncle Pete's issue of needing to paint boat bottoms every spring, determine the cost of hiring two additional full-time workers.
8. What factors other than cost should be considered in evaluating the above alternatives?
9. What should Jaime Giancola recommend to her mother and uncle, and why?

Case: Four Star Industries Singapore –Managing the MPS

1. What are the problems facing Four Star Industries in the mattress manufacturing operations?
2. How does increasing mattress variety impact four Star's operations?
3. Analyze the various courses of action that Sia Meng is contemplating to solve the operations problems. How effective will these actions be?
4. Discuss possible ways in which Four Star can reconfigure its product design, manufacturing and order fulfillment strategies. How will this help to solve its operational problems?

May 8: Final Examination-5-8 pm. (Please bring a calculator to exam; cell phones cannot be used for calculators. Equations will be provided.)