Competitive Advantage from Operations
Course Syllabus B01.2314.0 W2 (Winter 09)
(Subject to Minor Revisions)

COURSE DESCRIPTION:
This course serves as an introduction to Operations Management. The coverage of the discipline is very selective: We concentrate on a small number of powerful themes that have emerged recently as the central building blocks of world-class operations. We also present a sample of operations management tools and techniques that have been proved extremely useful over the years. The topics are equally relevant in the manufacturing and service sectors.

The course format is very intense. We will meet on three consecutive weekends: January 03-04, 10-11 and 17-18. Attendance in all sessions is required for full credit. If you have to miss up to one session, please notify the instructor in advance. Projects and exams will be due a week after our last session.

INSTRUCTOR: René Caldentey, KMC 8-77, (212) 998-0298, rcaldent@stern.nyu.edu
Office Hours: After class or by appointment.

T.A.: Aparajit Bhandarkar, abb315@stern.nyu.edu
Office Hours: Saturdays after class or by appointment.

MEETINGS: Saturdays and Sundays: 9:00am to 4:00pm
Room: T-201

CLASS MATERIAL:

Required:

CASES AND READINGS: Packet (e-version) available from the bookstore webpage (also, some additional cases will be distributed in class, and some can be downloaded from the course web site)

Recommended:


Other Operations Management References (Optional):
• Operations Management for Competitive Advantage (Tenth Edition), by Chase, Aquilano and Jacobs, Irwin / McGraw-Hill.

COMPUTER SOFTWARE: EXCEL
GENERAL INFORMATION

1. COMPETITIVE ADVANTAGE from OPERATIONS: (CUSTOM-TEXT in this Syllabus)
   This is a required textbook. The syllabus includes specific references to chapters in this book.

2. CASES DIGITALCOURSEPACK: Includes the following cases that we will use in this class.
   - Benihana of Tokyo (HBS)
   - National Cranberry Cooperative (Abridged) (HBS)
   - Blanchard Importing and Distributing Company, Inc. (HBS)
   - L.L. Bean, Inc. (HBS)
   - Toyota Motor Manufacturing, USA Inc. (HBS)
   - Zara, Fast Fashion (HBS)

   Please go to http://www.bookstores.nyu.edu/professional.store/course.winterintensive.html to order a copy of the Custom-Text and the Cases Digital Coursepack.

   The rest of the cases and readings will be distributed in class, and some can be downloaded from the course website. I will also post slides (and selected lecture notes) on the course website prior to each class.

   This an optional reading that I strongly recommend you to read before the first weekend of class.

GRADING COMPONENTS

- Individual Case Assignments    20%
- Group Homework    20%
- Class Participation    20%
- Individual Take-Home Exam    40%

   Please read the following descriptions very carefully (further details at the end of this syllabus)

Individual Case Assignments:

- There are six case assignments to be done **individually**. Submissions should be up to two pages in length and be submitted at the beginning of the session in which they are due. Keep a copy for your reference during class. Show all the work if your response requires a calculation.

Group Homework:

- There are two homework assignments to be done in groups of **maximum** four students. Assignments submitted by groups of five or more students will not be accepted for credit. In the same spirit, groups should not collaborate with each other for the purpose of doing the assignments. There is no restriction in the length of these homework submissions but precise and short answers are expected. Keep a copy for your reference during class.

Final Exam:

- There is a take-home exam due a week after our last meeting. The exam must be done **individually** and must be submitted in electronic format to the email account below:
  rcaldent@stern.nyu.edu
**Module I:** Introduction to Operating Systems: Process Design and Analysis

**Session 1:** *Production Processes and Process Design*

**Readings**

1. *The Goal* by E.M. Goldratt
3. Read Chapters 1 & 2 in Custom-Text: "Introduction to the Field" and "Operations and Supply Strategy".

**Virtual Plant Tours**

In this class, we will study different types of operating processes and discuss their suitability for producing various goods and services. Some of these processes and products are illustrated in about 50 virtual PLANT TOURS accessible from the website [http://www.mhhe.com/omc/tours-frames.htm](http://www.mhhe.com/omc/tours-frames.htm).

Study the following two tours and answer the questions that follow:


**Questions**

1. Identify the key elements of each company?s business strategy.
2. Identify the key elements of each company?s operating system. The operating system is the collection of all processes that a company uses to produce/deliver the goods and services that it offers.
3. What are the differences between the operating systems of the three firms?
4. What is your assessment of the fit between each company?s business strategy and its operations strategy?

**Case:**

*Benihana of Tokyo*, W. Sasser and J. Klug, Harvard Business School (1998). Read, analyze, and be prepared to discuss the Benihana of Tokyo case. Use the following study questions as an aid in analyzing the case.

a) Describe Benihana as an operating system. (Draw a process flow diagram.) List the relevant inputs, process, and output elements in three columns.
b) How does the operating system support the Benihana concept?
c) Which parameters of the operating system influence the throughput of a Benihana Restaurant?
d) How does the cost structure of a Benihana restaurant compare with that of a typical American restaurant? How does Benihana get its competitive advantage?

**Case Assignment #1: (Due at the Beginning of Class)**

*Answer questions b) and d) and submit at the beginning of class. Justify your answers.*

**Related Links**

Article *Implementing Restaurant Revenue Management*, available in course webpage.
Session 2: *Design of Operating Processes*

Readings:
1. Framework for Analyzing Service Operations (available on course website)

Topics:
- Types of Operating Processes
- Design of Goods and Services
- Distinctive Aspects of Service Management: Intangibility, Perishability, Heterogeneity.
- Matching Supply and Demand

Session 3: *Process Flow Analysis*

Readings
2. Read "Analysis of an Operation" (available on course website)

Topics:
- Flow Diagram
- Capacity, Throughput Time, Cycle Time
- Gantt Chart
- Bottleneck
- Factors that Affect Throughput and the Bottleneck
  - Order Size
  - Resources (Labor, Supplies)
  - Set-up Time
- Multi Product Analysis

Cases:
1. *Kristen’s Cookie Company (A)*. Available on custom-text pages 184-185. Read, analyze, and be prepared to discuss the Kristen’s Cookie Company case, utilizing the six key questions at the end as guides.
2. Read, analyze, and be prepared to discuss *National Cranberry Cooperative (Abridged)*.

Case Assignment #2: (Due at the Beginning of Class)

a) Draw a process flow diagram for the operating system in Kristen’s Cookie Co. Assuming that each order is a custom order for one dozen cookies. Compute the cycle time, throughput time, and capacity for each process in the system and for the entire operating system.

b) Identify ALL possible bottlenecks in the Kristen’s operation. Explain how would you reduce the negative effects of these bottlenecks in the production process?

Session 4: *Optimal Resource Allocation*

Readings
1. Read chapter 2A on the Custom-Text on Linear Programming (p. 36-55). This part of the chapter introduces linear programming and explains "Model Formulation" and the "Graphical Solution Procedure." We will discuss these topics in class.
2. Introduction to Linear Programming (available on course website)

Topics:
- Linear Programming
- Models and Applications
- Sensitivity Analysis and Shadow Prices
Module II: Managing for Competitive Advantage

Session 5: *Time-to-Market & Responsiveness*

Reading

1. Read Chapter 3: "Project Management" in Custom-Text.
2. Caselets: Four Project Management Exercises (see the course website): FCN Securities (B), FCN Securities (C), Specialty Contractors, Aerospace Components.

Topics:
- Project Management: CPM & PERT
- Crashing the project

Session 6: *The Effects of Uncertainty–Waiting Lines & Queueing Theory*

Readings

1. Read "Queueing management and Models" available on the course website.
2. Read chapter 8A: "Waiting Line Analysis" in Custom-Text (p. 276-305)
3. Read “Managing Real and Virtual Waits in Hospitality and Service Organizations” (available on course website)

Topics:
- Characteristics of a Waiting-Line System: Arrival, Waiting Line, Service Characteristics
- Measuring the Queue’s Performance and Queueing Costs
- Psychology of Queues

Case: Read, analyze, and be prepared to discuss *First City National Bank* case available on course website.

Session 7: *Quality as a Strategic Issue*

Topics: Quality – Its Definition and Basis for Competition: Quality Measurement and Improvement

Cases:
- TOYOTA MOTOR MANUFACTURING, USA INC. (available on Course-Packet)
- FORD-FIRESTONE. (available on course website)

Questions

**Toyota Case**

1. What are the principal components of the Toyota Production System? What capabilities must an organization possess in order to implement TPS effectively?
2. How does 'quality control' work at Toyota Motor Manufacturing?
3. As Doug Friesen, what would you do to address the seat problem? What options exist? Where would you focus your attention and solution efforts? What would you recommend and why?

**Ford-Firestone**

4. Is the situation serious? At what point in time? How did it happen? Who is responsible? How companies react to the problem? Could it have been prevented?
5. How can we know if a rollover is caused by a defective tire?
6. When the manufacturer is the responsible for a tire failure?

Case Assignment #3: (Due at the Beginning of Class)

*Explain how Toyota management (based on TPS philosophy) would have handled the different stages of the Ford-Firestone crisis.*

Related Links: Business week article “Can Anything Stop Toyota?” available on course website.
Session 8: *Process Improvement and Statistical Quality Control*

**Readings**

1. Read Chapter 9: "Six-Sigma Quality" in Custom-Text  
2. Read Chapter 9A: "Process Capability and SPC" in Custom-Text  
3. Read Chapter 12: “Lean Manufacturing” in Custom-Text

**Topics**

- Total Quality Management, Continuous improvement & Six Sigma  
- Control Charts

**Case:**  
*South Tree Electronics* case available on course website.

**Questions:** In analyzing South Tree’s quality control problem the following study questions may help: 

- Indicate on the process diagram, all current inspection points and note the accumulated cost and yield of each operation and test in the process.  
- How many circuits must you start with to achieve the desired output level?  
- At what yield rate would you be indifferent between continuing and discontinuing the first inspection in the process?

**Related Links:** WSJ article “The 'Six Sigma' Factor for Home Depot” available on course website.

**Submit Homework #1:** File with questions available on course website. Please make sure to get a copy of the homework the previous weekend. You can solve this homework in groups of up to 4 students.

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**Module III: Inventory and Supply Chain Management**

Session 9: *Inventory Concepts and Models*

**Reading**

1. Read Chapter 15: "Demand Management and Forecasting" in Custom-Text  
2. Read Chapter 17: "Inventory Control" in Custom-Text

**Topics:**

- Importance of Inventory  
- Inventory Measures  
- EOQ and Periodic Review Models

**Case:** BLANCHARD IMPORTING AND DISTRIBUTING COMPANY, INC. (Included in the Course-packet)

**Questions** : Use the following questions to analyze Blanchard’s demand data:

1. What is the purpose of forecasting and what are the main aspects of a "good forecast"?  
2. Considering the sales patterns for the Blanchard products, how should Blanchard forecast its demand?  
3. Apply and test your methodology on the data given in Exhibit 5 of the case. After addressing these questions, we will introduce a simple inventory model called the EOQ model in this class.

**Case Assignment #4: (Due at the Beginning of Class)**

*What are the PROS and CONS of the production/inventory strategy used at Blanchard?*
Session 10: Inventory in Action
Topics: Beer Game and the Bullwhip Effect.

Readings
1. Read Chapter 10: "Supply Chain Strategy" in Custom-Text
2. Read the article "The Bullwhip Effect in Supply Chains", available on course website.

Questions
In this class, we will draw inferences on supply chain performance from the beer game. Read the above articles, and use the following questions as guidelines to prepare for the class:

1. What problems did you face in meeting demand during the game?
2. In retrospect, how should you have determined your order quantities in every period in order to improve performance?
3. What information from your downstream and upstream players would have been useful in improving the performance of your supply chain?

Session 11: Inventory Management under Uncertainty

Reading
Read "A Note on the Newsvendor Model: Inventory Planning for Short Lifecycle Items." (pdf available on course website)

Case: L. L. BEAN, INC (Included in the Course-packet)

Questions

1. What are the challenges facing LL Bean in meeting demand for their products?
2. How does LL Bean use past demand data and a specific item forecast to decide how many units of that item to stock? Is this the best they can do?
3. What item costs and revenues are relevant to the decision of how many units of an item to stock?
4. How would you address the concerns of Rol Fessenden and Mark Fasold towards the end of the case?
5. How would you improve the forecasting and ordering process at LL Bean?

Case Assignment #5: (Due at the Beginning of Class)
What are the PROS and CONS of the demand forecast and inventory strategy used at L.L. Bean? Can you recommend a better system?

Session 12: Supply Chain Management

Readings Zara: Fast Fashion

Questions:

1. What is Zara value proposition to customers? How is Zara’s Supply Chain helping this value proposition? How is Zara managing the uncertainty in demand?
2. Under the Newsvenor paradigm, how would you compare the Overage and Underage costs of Zara and Gap?

Case Assignment #6: (Due at the Beginning of Class)
What are the operational factors that contribute to Zara’s competitive advantage?
In your opinion, what should Zara do to keep its competitive advantage?

Related Links: NYT article “Dell, It Turns Out, Has a Better Idea Than Ford” available on course website.

Submit Homework #2: File with questions available on course website
Please make sure to get a copy of the homework the previous weekend.
You can solve this homework in groups of up to 4 students.