



COMPETITIVE ADVANTAGE FROM OPERATIONS

COURSE SYLLABUS B01.2314.W2

(subject to minor revisions)

WINTER 2008

MEETINGS: Saturday/Sunday, 9:00AM – 12:00PM and 1:00PM – 4:00PM
January 5th – January 20th
Room 201, Tisch Hall

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Office hours: Saturday/Sunday 4:00PM – 6:00PM.

Location: Sosnoff Lounge, KMC lobby level

COURSE WEBSITE: Blackboard (<http://sternclasses.nyu.edu>)

OVERVIEW

Operations is concerned with the systematic design, management and improvement of the processes that transform inputs into finished goods or services. Operations is one of the primary functions of a firm. As marketing induces the demand for products and finance provides the capital, operations produces the product (goods and/or services).

This course provides a foundation for understanding the operations of a firm. The main objective is to provide you with several skills necessary to critically analyze a firm's operating performance and practices. Unlike many courses, which tend to treat the firm as a "black box", we will be primarily concerned with "opening up" the black box and discovering what makes a firm "tick" –or, for that matter, "stop ticking"–.

Because the operations of a firm vary widely from one industry to the next, a course like this cannot cover all topics that are relevant to any given industry. Rather, we have selected a set of topics that are fundamental to understanding operations in a wide range of manufacturing and service industries. These concepts are then illustrated using cases from a diverse set of businesses.

COURSE GOALS

The specific course objectives are to teach you to:

- Identify the operational capabilities needed to support a business strategy
- Define and characterize key business processes
- Establish clear performance objectives and process measures
- Understand the impact of demand and process variability in manufacturing and service industries
- Use data and modeling tools to evaluate and improve the efficiency of processes

CLASS MATERIAL

Required:

I) CASES AND READINGS: Packet available in Professional Bookstore (530 LaGuardia Place). It includes the following readings/cases that we will use in the course:

- Competing on Capabilities
- Benihana Of Tokyo
- Donner Company
- Toyota Motor Manufacturing, USA Inc.
- L.L. Bean, Inc.
- Zara: Fast Fashion

The rest of the cases and readings will be distributed in class, and some can be downloaded from the course web site. I will also post selected lecture notes on the course website prior to each class. At the beginning of each class, I will provide a hardcopy of the slides to be covered. A PDF file with the slides will be posted in Blackboard after each class.

II) CUSTOM TEXT: A customized version with selected chapters from *Operations Management for Competitive Advantage*; Chase, Aquilano and Jacobs; 11th edition; McGraw-Hill Irwin; 2006; and selected material from *Operations Management*; Stevenson; 8th edition; McGraw-Hill Irwin; 2004. Available at Professional Bookstore. This text is referenced as CUSTOM-TEXT in this Syllabus.

Recommended:

I) THE GOAL: “*The Goal: A Process of Ongoing Improvement*”, Third Revised Edition (also available in bookstore), by Eliyahu Goldratt and Jeff Cox, North River Press, Inc. 2004. This is an optional reading that I would recommend to read before the first weekend of classes.

Other Operations Management References (Optional):

- *Operations Management for Competitive Advantage* (Eleventh Edition), by Chase, Aquilano and Jacobs, Irwin / McGraw-Hill, 2006.
- *Designing and Managing the Supply Chain: Concepts, Strategies, and Cases*, by David Simchi-Levi, Philip Kaminsky and Edith Simchi-Levi, 2nd edition, Irwin / McGraw-Hill, 2003.

COMPUTER SOFTWARE: EXCEL

GENERAL INFORMATION

GRADING COMPONENTS

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

INDIVIDUAL CASE ASSIGNMENTS

There are six case assignments to be done **individually**. Submissions should be up to two pages in length and should 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.

If you have questions regarding the grading of the assignments, you should discuss them with the TA first.

GROUP HOMEWORK

There are two homework assignments to be done in **groups of maximum four students**. 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. Group homeworks are due at the beginning of the session in which they are due.

If you have questions regarding the grading of the group homeworks, you should discuss them with the TA first.

ATTENDANCE AND LATENESS

Attendance is mandatory for the course. However, you can skip up to two sessions (i.e., two half-days) due to business reasons without any impact on your “attendance grade”, as long as you notify the instructor in advance.

In addition, you are expected to arrive to class on time and stay to the end of the class period. Arriving late or leaving early will have an impact on the attendance grade.

CLASSROOM BEHAVIOR

Laptops, cell phones, smartphones & other electronic devices may not be used in class.

FINAL EXAM

There is a take-home exam due on Monday January 28th. The exam must be done **individually** and must be submitted in electronic format via the Digital Dropbox in Blackboard.

Module I: Introduction to Operating Systems: Process Analysis and Design

Session 1 (Jan 5th AM) INTRODUCTION. OPERATIONS AS A SOURCE OF COMPETITIVE ADVANTAGE. PRODUCTION PROCESSES.

Required readings:

- *Competing on Capabilities: The New Rules of Corporate Strategy* (included in case Course-packet) by G. Stalk Jr., P. Evans and L. E. Shulman, published in Harvard Business Review, March-April 1992.
- Chapter 5: "Process Analysis", in Custom-Text.

Optional reading:

- Article *Implementing Restaurant Revenue Management*, available on Blackboard.

Topics:

- Introduction to operating systems
- Operational strategy: Core competencies and capabilities

Case:

Benihana of Tokyo, W. Sasser and J. Klug, Harvard Business School (2004). 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. Answer questions b) and d) and submit at the beginning of class. Justify your answers.

Related Links

Benihana profile: http://www.benihana.com/company_profile.asp

A history of Benihana: http://www.benihana.com/benihana_history.asp

Session 2 (Jan 5th PM). DESIGN OF OPERATING PROCESSES

Required reading:

- Chapter 6: "Manufacturing Process Selection and Design" in Custom-Text.

Optional reading:

- Framework for Analyzing Service Operations (available on course website)

Topics:

- Types of Operating Processes: The Product-Process Matrix
- Distinctive Aspects of Service Management: Intangibility, Perishability, Heterogeneity.
- Process analysis

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> .

Study the following two tours and think about the questions that follow:

1. Stickley furniture (<http://www.stickley.com/>): Job shop. Follow the links to the factory tour and the video tour (12 mins).
2. Toyota Motor Company (<http://www.toyotageorgetown.com/vtour/vtour.asp>): Assembly line process.

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 two firms?
4. What is your assessment of the fit between each company's business strategy and its operations strategy?

Session 3: (Jan 6th AM). PROCESS FLOW ANALYSIS**Required reading:**

- Chapter 11: "Strategic Capacity Management" in Custom-Text.

Optional reading:

- Article "Analysis of an Operation" (available on course website)

Topics:

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

Cases:

1. *Kristen's Cookie Company*. Available on Custom-Text (Ch 5, page 178). Read, analyze, and be prepared to discuss the Kristen's Cookie Company case, utilizing the six key questions at the end as guide.
2. Read, analyze, and be prepared to discuss *Donner Company case* (included in case Course-packet)

Case Assignment #2. Answer and submit the questions below at the beginning of the class:

a) *Kristen's Cookie Co. (A) case: How would you categorize Kristen's operation in terms of the product-process matrix? Explain. Draw a process flow diagram for the operating system in Kristen's Cookie Co.*

b) *Donner Company case: How would you categorize Donner's operation in terms of the product-process matrix? Explain. What problems is Donner currently facing? Which are the causes of those problems?*

Session 4 (Jan 6th PM) OPTIMAL RESOURCE ALLOCATION**Required reading:**

- Last chapter on the Custom-Text on Linear Programming (p. 807-829). This part of the chapter introduces linear programming and explains "Model Formulation" and the "Graphical Solution Procedure". We will discuss these topics in class.

Optional reading:

- 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** (Jan 12th AM). TIME-TO-MARKET AND RESPONSIVENESS**Required reading:**

- Chapter 3: "Project Management" in Custom-Text.

Practice problems:

- 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 (Jan 12th PM) THE EFFECTS OF UNCERTAINTY: WAITING LINES AND QUEUEING THEORY

Required readings:

- Technical Note 7: "Waiting Line Management", in Custom-Text (p. 288)
- Article "Managing Real and Virtual Waits in Hospitality and Service Organizations", available on course website.

Optional reading:

- Article "Queueing management and models", available on the course website.

Topics:

- Characteristics of a waiting-line system: arrival, waiting line, service characteristics
- Measuring the queue's performance and queuing costs
- Psychology of queues

Case:

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

Session 7 (Jan 13th AM) QUALITY AS A STRATEGIC ISSUE

Required reading:

- Chapter 8: "Quality Management: Focus on Six Sigma" in Custom-Text.

Case:

Toyota Motor Manufacturing, USA INC (available in Course-Packet). Read, analyze, and be prepared to discuss the Toyota case. Use the following study questions as an aid in analyzing the case:

- What are the principal components of the Toyota Production System? What capabilities must an organization possess in order to implement TPS effectively?
- How does "quality control" work at Toyota Motor Manufacturing?
- 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?

Case Assignment #3: *Answer question a) above and submit at the beginning of class. Justify your answer.*

Related Link:

Business Week article: "*Can Anything Stop Toyota?*", available on course website.

Session 8 (Jan 13th PM) PROCESS IMPROVEMENT AND STATISTICAL QUALITY CONTROL**Required reading:**

- Technical Note 8: "Process Capability and Statistical Quality Control" in Custom-Text (p.346)

Topics:

- Continuous improvement & Six Sigma
- Control charts

Related Link:

WSJ article: "The 'Six Sigma' Factor for Home Depot", available on course website.

Case:

South Tree Electronics case available on course website. When 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?

**SUBMIT GROUP HOMEWORK #1: FILE WITH QUESTIONS AVAILABLE ON COURSE WEBSITE
YOU MUST SOLVE THIS HOMEWORK IN GROUPS OF UP TO 4 STUDENTS.**

Module III: Inventory and Supply Chain Management**Session 9** (Jan 19th AM) INVENTORY CONCEPTS AND MODELS**Required readings:**

- Chapter 15: "Inventory Control" in Custom-Text

Topics:

- Importance of inventory
- Inventory measures
- Continuous and periodic review models

Case:

Acme Widget case (downloadable from Blackboard). Read, analyze, and be prepared to discuss the Acme case.

Case Assignment #4. *Answer and submit: What problems did ACME face after launching the warehouse program? What could be the potential causes for those problems?*

Session 10 (Jan 19th PM) INVENTORY IN ACTION: THE BEER GAME

In this class, we will draw inferences on supply chain performance from the Beer Game.

Required reading:

- Chapter 10: "Supply Chain Strategy" in Custom-Text

Session 11 (Jan 20th AM) INVENTORY MANAGEMENT: NEWSVENDOR MODELS**Required readings:**

- Chapter 13: "Forecasting" in Custom-Text
- "A Note on the Newsvendor Model: Inventory Planning for Short Lifecycle Items", available on course website.

Case:

L. L. Bean, INC (included in the Course-packet). Read, analyze, and be prepared to discuss the L.L. Bean case. Use the following study questions as an aid in analyzing the case:

- a) What are the challenges facing LL Bean in meeting demand for their products?
- b) 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?
- c) What item costs and revenues are relevant to the decision of how many units of an item to stock?
- d) How would you address the concerns of Rol Fessenden and Mark Fasold towards the end of the case?
- e) How would you improve the forecasting and ordering process at LL Bean?

Case Assignment #5. *Answer and submit at the beginning of the 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 (Jan 20th PM) SUPPLY CHAIN MANAGEMENT**Required reading:**

- Read the article "The Bullwhip Effect in Supply Chains", available on course website.

Case:

Zara: Fast Fashion. Read, analyze, and be prepared to discuss the Zara case. Use the following study questions as an aid in analyzing the case.

- a) What is Zara value proposition to customers? How is Zara's Supply Chain helping this value proposition?
- b) How is Zara managing the uncertainty in demand?

- c) Under the Newsvendor paradigm, how would you compare the Overage and Underage costs of Zara and Gap?

Case Assignment #6. *Answer and submit at the beginning of the 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 GROUP HOMEWORK #2: FILE WITH QUESTIONS AVAILABLE ON COURSE WEBSITE
YOU MUST SOLVE THIS HOMEWORK IN GROUPS OF UP TO 4 STUDENTS.

OVERVIEW OF INDIVIDUAL ASSIGNMENTS AND GROUP HOMEWORKS

Assignment	Due Date
Case Assignment #1: Benihana	Jan 5 th AM (Session 1)
Case Assignment #2: Kristen's and Donner	Jan 6 th AM (Session 3)
Case Assignment #3: Toyota	Jan 13 th AM (Session 7)
Group Homework #1	Jan 13 th PM (Session 8)
Case Assignment #4: Acme	Jan 19 th AM (Session 9)
Case Assignment #5: L.L. Bean	Jan 20 th AM (Session 11)
Case Assignment #6: Zara Group Homework #2	Jan 20 th PM (Session 12)