STERN SCHOOL OF BUSINESS
NEW YORK UNIVERSITY
COURSE SYLLABUS C60.0001.00X
COMPETITIVE ADVANTAGE FROM OPERATIONS
SPRING 2003

MEETINGS: Tuesday/Thursday, Tisch 201, 2:00 PM-3:15 PM

INSTRUCTOR: Sridhar Seshadri

OFFICE HOURS: TBA

TEACHING ASSISTANT: Sonu K. Samuel
Office Hours: TBA

Room: TBA

Email: "Sonu K. Samuel" <sks253@stern.nyu.edu>

REQUIRED COURSE MATERIALS:

CUSTOM TEXT: Competitive Advantage From Operations (3rd edition, 2003); a customized text created for Stern students including

- NYU Cases and Readings
- Harvard Cases and Readings.

This book was prepared by Pearson Custom Publishing. The book will be denoted as H&R in the outline. Consecutive page numbers in the top center of the book will used to refer to materials from the book.


COMPUTER SOFTWARE: EXCEL, HOM
MATERIALS REQUIRED

CUSTOM TEXT:  COMPETITIVE ADVANTAGE FROM OPERATIONS,

COMPUTER SOFTWARE:

  • EXCEL
  • HOM (to be downloaded from the internet, see instruction in the textbook)

HARVARD CASES (Included in Custom Text)
  • BENIHANA OF TOKYO
  • KRISTEN'S COOKIE CO.
  • DONNER COMPANY
  • BLANCHARD IMPORTING AND DISTRIBUTING COMPANY, INC.

STANFORD CASE
  • DELL DIRECT

NYU CASES
  • FORD-FIRESTONE CASE
  • OTTO DEVELOPMENT CORPORATION

OTHER MATERIAL (Included in Custom Text)
  • TERMS USED IN OPERATIONS MANAGEMENT
  • HOM INTRODUCTION
  • ANALYSIS OF AN OPERATION
  • FCN SECURITIES DEMO (A), (B) AND (C)
  • NETWORK CASES
  • WAITING LINES
  • FIRST CITY NATIONAL BANK
  • SOUTH TREE ELECTRONICS
  • INDEPENDENT DEMAND INVENTORY SYSTEMS

THE GOAL, Second revised edition (Buy in Bookstore), Eliyahu Goldratt, North River
Press, Inc., 1992
HONOR CODE

I expect every student to be familiar with the Stern School of Business Honor Code. Some of the ways in which the code applies to this course are discussed below:

- The honor code stipulates that no student will lie, cheat, copy or otherwise behave in an unfair manner to obtain academic advantage over other students.
- As per the honor code, an individual’s name on a report should be included only if they have contributed to the analysis. If an individual has not contributed to the analysis in an intellectual manner, it is a violation of the honor code to include his or her name.
- Furthermore, you may not refer to case writeups from classes offered in earlier semesters.
- The premise of the honor code is that ideas should be attributed to their source. Therefore, please acknowledge the main source(s) of data, facts, and ideas (other than from the instructor or textbook) in all your written work and when you make a presentation. If you use material from a source other than the lecturer, the textbooks or the lecture notes, you must attribute the source. For example, say, “I discussed this with the TA.” Or “I obtained this from the following website.”
- You may discuss the homework with your class mates, TA or me. However, you must do them individually. The discussion is limited to “how to solve” type of questions. The actual solution must be done individually. Do not be worried of getting the answer incorrect in the homework. Most of the points will be given for using the correct approach.

ELECTRONIC DISCUSSION

This course will use Prometheus. You are strongly urged to post your comments, questions and response to specific questions in the outline. In particular, you can: (a) post interesting examples illustrating concepts discussed in class, (b) questions about concept or calculations that are unclear in class, and (c) links to relevant websites.

The TA and I will be reading these discussions. Please keep the discussions strictly relevant to the course and the language as professional as possible.
SYLLABUS

COMPETITIVE ADVANTAGE FROM OPERATIONS

SPRING 2003

MODULE 1: Introduction to Operating Systems: Process Design and Analysis

Jan 21  SESSION 1: INTRODUCTION – OPERATIONS AS A SOURCE OF COMPETITIVE ADVANTAGE

1. Begin reading “The Goal” by E.M. Goldratt (should be completed by Feb 28)
2. To be discussed in class:
   • Compare and contrast the business strategies of Fedex, UPS and the USPS. Is the recent strategic move by Fedex to focus more on ground transport consonant with the changes in the environment and compatible with its current operation strategy?
   • Recall some recent decisions made by you to purchase a product or to visit a service provider (hotel, airtravel, bursar, etc.). What were the high and low points of your experience and why?

Jan 23  SESSION 2: PROCESS DESIGN AND FIRM STRATEGY

1. Read Chapter 1 in Heizer and Render (H&R)
2. Read Analysis of Operations
3. Read, analyze, and be prepared to discuss the Benihana of Tokyo case (p. 575 H&R). 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?
   (e) What is the proper relationship between the number of tables in the dining room and number of seats in the bar? Assume they want the average customer to stay 24 minutes in the bar. Explain.
4. Homework 1: Answer questions (d) and (e) and submit at the beginning of class. Retain a copy of homework submitted.
Jan 28 SESSION 3: OPERATING SYSTEMS – PROCESS CHOICE AND IMPLICATION FOR OPERATIONAL VARIABLES

1. Read Chapter 7, pages 131-153 in H&R.
2. Read Terms Used In Operations Management (p. 483 H&R).
3. Prepare discussion questions 2, 4, 9, 11, 12, 13, and 14 in H&R (p. 170-171) (prepare means read and get familiar with the answers, you do not need to submit. However, some of these questions may appear in the exams.)

Electronic discussion: How does process choice affect other operating decisions, such as, labor, IT, control systems, time to market, time to respond to market changes? Give examples.

Jan 30 SESSION 4: PROCESS ANALYSIS: PROCESS CAPACITY AND PROCESS COST, TIME, VARIETY

1. Read Chapter 7, pages 153-159 in H&R.
2. Read, analyze and be prepared to discuss the Kristen's Cookie Company case (p. 595 H&R) utilizing the six key questions at the end as guides. In particular prepare question 3 below.
3. What are the cycle time, throughput time, and capacity of each operation and the whole production system?
4. Your Group must SUBMIT the name, address, and brief (1 or 2 sentences) description of the company you are electing for your Group Term Project. Please make sure to obtain the permission from the local manager.
5. Homework 2: Draw a Gantt chart for Kristen's operation assuming orders are for two-dozen cookies, orders come every 20 minutes AND Kristen’s room mate is absent. Submit this analysis at the beginning of NEXT class.

REMINDER: TERM PROJECT 1 DUE SESSION 8. THE COMPANY MUST BE IDENTIFIED BY THE NEXT CLASS SESSION

Feb 04 SESSION 5: PROCESS ANALYSIS: PROCESS CAPACITY AND PROCESS COST, TIME, VARIETY

1. Draw a Gantt chart for Kristen's operation assuming orders are for two-dozen cookies, orders come every 20 minutes AND Kristen’s room mate is absent. Submit this analysis at the beginning of this class.
February 6 SESSION 6: THE EFFECTS OF SET-UP TIME ON CAPACITY

1. Read the Donner Company case (p. 601 H&R). Use the EXCEL spreadsheets discussed in class (Donner.xls and Donner1.xls) to analyze and understand the relationships between number of orders (set-ups) in a month, order size, and capacity.

2. Use the following study questions as guides in analyzing the case:
   a) Describe Donner as an operating process. To simplify this task, consider only the flow of the most important output.
   b) Assume Donner has to process 60 orders in a certain month. What is the capacity (in terms of the number of boards) of each operation and of the entire system?
   c) What factors influence the capacity of the entire system? What is the current utilization of the machines?
   d) What was the efficiency of Donner?
   e) What are the causes of the major problems described at the end of the case? How would you propose to resolve them?

Electronic discussion: You could choose to post your analysis to questions (c) and (e) in the discussion board of Prometheus.

MODULE 2: Managing for Competitive Advantage: Time-to-Market & Responsiveness

February 11 SESSION 7: TIME BASED COMPETITION

1. Read Chapter 16 in H&R (p. 329 H&R). Attempt the discussion questions at the end of the chapter. These do not have to be submitted.

2. Six project management exercises have been assigned. Draw the networks for the projects described in the FCN/Securities Demo (A) exercise (p. 519 H&R), and the Allied Distributing exercise (p. 525 H&R).

February 13 SESSION 8: PROJECT MANAGEMENT

1. Read, analyze and be prepared to discuss the other four project management network cases (exercises) assigned in class: FCN (B), FCN (C) (p. 520-21), Specialty Contractors, and Aerospace Components (p. 527-29).

2. Homework 3: Submit an analysis and solution to the FCN(B) case. HOM can be used for analyzing the case.
**Term Project 1**: Prepare and submit (at the beginning of class) a definition of the organization you have chosen in terms of:

- a) Goals of the organization
- b) Product or service offered
- c) Market
- d) Competitive strategy
- e) Customers
- f) Workers

Feb 18 **SESSION 9**: THE EFFECTS OF UNCERTAINTY - WAITING LINES

1. Read Quantitative Module D in H&R on Waiting Lines and Queuing Theory (p. 407 H&R).
2. Read the article Waiting Lines (p. 531 H&R).
3. Prepare the sixteen discussion questions at the end of Module D in H&R (p. 429-30). Do not submit.


**REMINDER: TERM PROJECT 2 DUE SESSION 12**

Feb 20 **SESSION 10**: QUEUING THEORY IN ACTION

1. **Homework 4**: Submit the solutions to problems D3, D7 and D9 in H&R (p. 430-431).
2. Read, analyze, and be prepared to discuss the First City National Bank case (p. 631 H&R). The following study questions will help:
   - a) Considering the data supplied for arrival and service times, how would you calculate an average arrival rate and service rate?
   - b) As Mr. Craig, what characteristics of this queuing system would you be most interested in observing?
   - c) What is the best number of tellers to use?
   - d) Calculate the waiting time for a customer (time spent in the queue before service) and determine which of the two line configurations you would recommend. Support your result with the appropriate quantitative queuing analysis.
Feb 25 **SESSION 11**: AN INTRODUCTION TO SIMULATION

1. Read Quantitative Module F in H&R on simulation (p. 439 H&R).
2. Discussion questions 1,2,4,5,7,10,11,12 and 13 H&R (p. 455)
3. Prepare problem F.1 H&R (p.456)

Feb 27 **SESSION 12**: USE OF SIMULATION AS A PROBLEM SOLVING TOOL FOR OPERATING SYSTEMS

1. **Homework 5**: Consider the First City National Bank case again. By hand, simulate and submit 25 arrivals (track them through the bank) using the interarrival time distribution and service time distribution given in the case, with three tellers, for each of the two line arrangements. Identify assumptions that are necessary.
2. Consider the First City National Bank case again. What are the advantages of using simulation to study this operation? What are the limitations?
3. Which alternative arrangement of teller lines should Mr. Craig select based on the simulations?

**Term Project 2**: Prepare and submit (at the beginning of class) a description of the workflow in your organization. Follow these suggested questions for your description:
What are the tasks and how are they linked, ordered, etc.? What/where/when do they receive raw materials, subassemblies, etc.? At what stage of the process are outputs produced? How does information flow? Is your organization a flow, job or project shop? Draw a process diagram. Draw a facility layout. Where is the line of visibility? What are the measures of capacity for the organization? What is its capacity? Do you notice any activities that do not add value to the organization? (4-5 pages).

**OPTIONAL SESSION**


The book, The Goal, has been turned into an excellent movie. The length of the film is 50 minutes. We will have four showings of the movie. From feedback received and own experiences, seeing the movie after reading the book greatly enhances the learning experience. The viewing is completely optional. Seats will be filled on first come first seated basis. Please bring your own popcorn.

Mar 04 **SESSION 13**: REVIEW OF COURSE TO DATE

Mar 06 **SESSION 14**: MIDTERM EXAM

The examination will be in class. It will be open book and open notes. A sample exam will be provided shortly. You are invited to contribute sample questions by email to the professor. Send in your favorite questions as well as your doubts.
MODULE 3: Managing for Competitive Advantage: Quality as a Strategic Issue

Mar 11 SESSION 15: QUALITY – ITS DEFINITION AND BASIS FOR COMPETITION

1. Review of the Mid-term exam.
2. Preview of the next half of the course.
3. Read the Ford-Firestone case (to be distributed in class) and be prepared to discuss it. In particular attempt question 4 below to determine what was the true cause of the problem?
4. Prepare a Fishbone Diagram of the problem.
5. Read Chapter 6 in H&R (p. 67).
6. Prepare discussion questions 5, 9, 11 and 12 H&R (p. 89).

Electronic discussion: Post your views on the recall. How does it compare with other product recalls? Are product recalls inevitable? Can the society do something about them?

Mar 13 SESSION 16: QUALITY ANALYSIS, MEASUREMENT AND IMPROVEMENT

1. Six sigma quality and how it applies to product and process design.
2. What is process capability? How to measure process capability?
3. How does six sigma quality relate to the teaching of Deming?
4. What is meant by “Quality is free.”

REMINDER: TERM PROJECT 3 DUE SESSION 19

Mar 25 SESSION 17: STATISTICAL QUALITY CONTROL

1. Read the Supplement to Chapter 6 in H&R (p. 97).

Mar 27 SESSION 18: QUALITY IMPROVEMENT

1. Read, analyze and be prepared to discuss the quality control issues in the South Tree Electronics case (p. 545 H&R).
2. In analyzing South Tree's quality control problem the following study questions may help:
a) Indicate on the process diagram, all current inspection points and note the accumulated cost and yield of each operation and test in the process.
b) How many circuits must you start with to achieve the desired output level?
c) At what yield rate would you be indifferent between continuing and discontinuing the first inspection in the process?

3. **Homework 6**: Calculate and submit the cost of a good S-39 circuit. Show all work.

**MODULE 4: Managing for Competitive Advantage: Inventory Concepts and Models**

Apr 01 **SESSION 19: INVENTORY / LOGISTICS**

1. Read Chapter 12 in H&R (p. 221 H&R).
2. Read the article Independent Demand Inventory Systems (p. 553 H&R).

**Term Project 3**: (You may choose to do either Term Project 3 or 4.) Prepare and submit (at the beginning of class) answers to the following questions: How does quality affect your operations? Does it affect throughput, demand, facility/staff size etc.? How do you define and measure quality? Hoe would you go about improving quality? (3-4 pages).

*Electronic discussion: How many items does a supermarket (choose one close to NYU) carry? How much is the inventory (value)? What factors affect the inventory? Who manages inventory?*

Apr 03 **SESSION 20: THE ROLE OF INVENTORY - THE TRADITIONAL VIEW FOR MATURE PRODUCTS**

1. Read and analyze the Xenon Drives case (to be distributed in class). Be prepared to discuss questions 1, 2, 4 and 6
2. **Homework 7**: Answer and submit questions 2 and 4 above.

**REMINDER: TERM PROJECT 4 DUE SESSION 23**

Apr 08 **SESSION 21: INVENTORY MANAGEMENT – THE SUPPLY CHAIN VIEW – MATCHING DEMAND AND SUPPLY**

1. Read Chapter 11 and the Supplement to Chapter 11 in H&R (p. 181).
2. Read and be prepared to discuss the Dell Direct case (to be distributed in class).
3. Answer the following questions
   - What are the operational factors that contribute to Dell’s competitive advantage?
   - In your opinion, what should Dell do to keep their competitive advantage?
**ELECTRONIC DISCUSSION:** Can the Ford motor company sell all its cars solely using the web? Why? Why not? How about Merck selling pharmaceuticals solely using the web? Selling insurance products direct to customers?

Apr 10 **SESSION 22:** INVENTORY IN ACTION: THE BEER GAME

**PLEASE BE A FEW MINUTES BEFORE TIME!!**

Apr 15 **SESSION 23:** JUST-IN TIME and LEAN PRODUCTION

1. Debrief of the Beer Game
2. Read the Supplement to Chapter 12 in H&R on Just-in-Time systems (p. 265).
3. Discussion questions 1,4,5,6,8,9 and 10 H&R (p.282).

**Term Project 4:** Prepare and submit (at the beginning of class) answers to the following questions: Can your product or service be inventoried? How does your organization handle inventory? What policy does it use for replenishment? How would you implement a "Just-in-Time" philosophy in your environment?

**MODULE 5: Allocating Resources for Strategic Capacity Planning**

Apr 17 **SESSION 24:** THE BASIC LINEAR PROGRAMMING (LP) PROBLEM

1. Read Quantitative Module B: Linear Programming in H&R (pages 372-393). You may do the first reading for a quick overview.
2. Read (more carefully) pages 372-375, again.
3. Prepare to discuss questions 1,2,3,7,8 and 9 H&R (p.396).
4. Attempt Problem B.1 on page 396.
5. Be sure you get the handout with extra problems.

**Electronic discussion:** What examples represent the greatest success stories of using LP?

Apr 22 **SESSION 25:** SOLUTION TECHNIQUES: GRAPHICAL METHOD AND ENUMERATING THE CORNER POINTS

1. Read pages 375-381 in Quantitative Module B (H&R).
2. Solve problems B.2 and B.3 on page 396 using (a) graphical method, (b) “enumerating the corner points” method.
Apr 24 SESSION 26: LP SOLUTION (EXCEL INTERPRETATION)

1. *Homework 8*: Solve and submit problems on the Hand-out Sheet using:
   (a) graphical method, (b) “enumerating the corner points” method, and
   (c) EXCEL
2. Solve Problem B.1 and B.2 on page 396, using this method.
3. Interpret the results

Apr 29 SESSION 27: USING THE LP MODEL

1. Read pages 381-392 in Quantitative Module B (H&R).
2. Read, analyze, and be prepared to discuss the Otto Development Corporation case
   (to be distributed in class).

May 01 SESSION 28: REVIEW OF COURSE TO DATE

A sample final exam will be provided. You are invited to contribute sample questions by
email to the professor. Send in your favorite questions as well as your doubts.

**SPECIAL SESSION (FRIDAY April 25th)**

**Final Project Report**
(Time and Room to be discussed in class)

*Please submit the Final Project Report of the Term Project at this all-day session.*
The final report consists of the three earlier reports plus a 2-3 page executive summary.
In the executive summary, list your conclusions and recommendations to management
and discuss possible implementation. You may want to consider the comments you have
received on earlier reports.

*Prepare a 15-minute PowerPoint presentation to be given to the entire class.*

*In particular, please be prepared to stay the whole day, starting from 9:00 am until
5 pm.*

**FINAL EXAMINATION Time and Date T.B.A.**

The exam will be open book. A sample final exam will be distributed. Please email me
your questions and doubts.
GRADING

Class Participation, Attendance  10%
(includes electronic contributions, presence during beer games and quizzes etc)
Mid-Term Examination (Open book)  25%
Final Examination (Open book)  25%
Short Reports, Term Project (Group work)  25%
Homework, Quizzes  15%

TERM PROJECT

Groups of students (maximum 5) will be formed to undertake a term project as part of the course requirements. Your group will choose a local operation to study (preferably, select an operation that is not located between 8th Street and Houston Street). Examples are: a branch of a bank, green-grocery, super market, restaurant, auto-body shop, record store, drug store, copy shop, etc.

At four times during the course, you will be asked to submit a short report that describes and analyzes a different aspect of the operating system of the company that you have selected. You must submit the first two reports, and you have a choice of doing either the third or fourth report. Your responses in these short papers will form the basis of the final term project that will be handed-in at the end of the semester.

HOMEWORK

You will be assigned homework on a class-to-class basis for each topic. The homeworks are due on the dates (sessions) where the assignments appear in the syllabus. Only homeworks that are specifically designated as SUBMIT are to be handed-in at the beginning of class. Keep a copy of all homework submitted for reference during class.

Homework will be graded, and will not be accepted late. They must be prepared individually in order to receive credit. Please write clearly or word process your homework.

QUIZZES

A quiz might be given in any class in which a case is to be discussed. The quiz will relate to facts given in the case and study questions asked in the syllabus.

HOW TO PREPARE FOR CLASS DISCUSSIONS

Please read the cases carefully. Use the study questions supplied in the syllabus as a guide. Be prepared to be called-upon to present the facts of the case, or to carryout the analysis indicated by the study questions.
## OVERVIEW OF ASSIGNMENTS WITH DUE DATES

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**TBA** | **FINAL EXAM** |