



**STERN SCHOOL OF BUSINESS
NEW YORK UNIVERSITY
COURSE SYLLABUS C60.0001.003
COMPETITIVE ADVANTAGE FROM OPERATIONS**

MEETINGS: T.B.A

INSTRUCTOR: Rene Caldentey, Room KMC 8-77, (212) 998-0298
rcaldent@stern.nyu.edu

OFFICE HOURS: By appointment

TEACHING ASSISTANT: T.B.A.

REQUIRED COURSE MATERIALS:

CUSTOM TEXT: Competitive Advantage from Operations (Fourth Edition)
a customized text created for Stern students including

- Chapters from Heizer and Render, *Operations Management*, 6th edition, Prentice Hall, 2001
- NYU Cases and Readings
- Harvard Cases and Readings.

This book was prepared by Pearson Custom Publishing.

THE GOAL, second revised edition (buy in bookstore), Eliyahu Goldratt, North River Press, Inc. 1992

COMPUTER SOFTWARE: EXCEL



MATERIALS REQUIRED

CUSTOM TEXT: COMPETITIVE ADVANTAGE FROM OPERATIONS,
Pearson Custom Publishing; 2001.

COMPUTER SOFTWARE: NYU Software Packages

- EXCEL

HARVARD CASES (Included in Custom Text)

- BENIHANA OF TOKYO
- KRISTEN'S COOKIE CO.
- DONNER COMPANY
- TOYOTA MOTOR MANUFACTURING[†]
- BLANCHARD IMPORTING AND DISTRIBUTING COMPANY, INC.
- L.L. Bean, Inc.[†]

STANFORD CASE

- DELL DIRECT

NYU STERN CASE

- THE FORD-FIRESTONE CASE

OTHER MATERIAL (Included in Custom Text)

- TERMS USED IN OPERATIONS MANAGEMENT
- HOM INTRODUCTION
- ANALYSIS OF OPERATIONS
- 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

[†]: Not included in Custom text; to be distributed in class.



SYLLABUS

COMPETITIVE ADVANTAGE FROM OPERATIONS

SPRING 2005

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

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

1. Read The Goal by E.M. Goldratt (should be completed within four weeks of start of course)
2. To be discussed in class, a systematic approach to problem solving

SESSION 2: PROCESS DESIGN

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 (pages 549-566 in 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.
2. **Homework #1: T.B.A.**

Make sure to retain a copy of all homework submitted.



SESSION 3: OPERATING SYSTEMS – TYPES OF OPERATING PROCESSES

1. Read Chapter 7, pages 131-143 in H&R.
2. Read Terms Used In Operations Management (p.457-459 in H&R)
3. Discussion questions 2,4,9,11,12,13, and 14 in H&R (p168-169)

SESSION 4: DESIGN OF GOODS AND SERVICES

1. Read Chapter 7, pages 143-153 in H&R
2. Read Chapter 5, pages 39-46 and 53-57 in H&R

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

SESSION 5: PROCESS ANALYSIS

1. Read, analyze and be prepared to discuss the Kristen's Cookie Company case (p. 569-571 in H&R) utilizing the six key questions at the end as guides.
2. What are the cycle time, throughput time, and capacity of each operation and the whole production system? Submit this analysis at the beginning of class.
3. Draw a Gantt chart for Kristen's operation assuming orders are for two-dozen cookies.
4. **Term Project:** Your Group must **SUBMIT** the name and brief (1 or 2 sentences) description of the company you will be working for your **Group Term Project**.
5. Get a copy of homework#2 handout

SESSION 6: THE EFFECTS OF SET-UP TIME ON CAPACITY

1. Read the Donner Company case (p. 575-588 in 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?
3. You should have finished (or almost finished) reading The Goal.
4. **Homework #2: T.B.A**



MODULE 2: Optimal Resource Allocation

SESSION 7: THE BASIC LINEAR PROGRAMMING (LP) PROBLEM

1. Read Quantitative Module B: Linear Programming in H&R (pages 327-348). You may do the first reading for a quick overview.
2. Read (more carefully) pages 327-337, again.
3. Attempt Problem B.1 on page 396.
4. Be sure you get the handout with five extra problems.

SESSION 8: SOLUTION TECHNIQUES: GRAPHICAL METHOD AND ENUMERATING THE CORNER POINTS

1. Read pages 337-348 in Quantitative Module B (H&R).
2. [Homework #3: T.B.A.](#)
3. Solve problems B.2 and B.3 on page 396, using (a) Graphical and (b) Enumerating the Corner Points methods.

[Term Project 1:](#) Prepare and submit (at the beginning of class) a definition of the organization you have chosen in terms of (see the end of this syllabus for more details):

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

SESSION 9: LP SOLUTION (LINDO OR EXCEL INTERPRETATION)

1. [Homework #4: T.B.A.](#)
2. Solve problems 1-5 on the Hand-out Sheet using EXCEL method.
3. Solve Problem B.1 and B.2 on page 396, using this method.
4. Interpretation of the results
5. Get a copy of homework #5 handout.

REMINDER: TERM PROJECT 2 DUE SESSION 12

SESSION 10: USING THE LP MODEL

1. Read pages 337-348 in Quantitative Module B (H&R).
2. Read, analyze, and be prepared to discuss the Otto Development Corporation case.



MODULE 3: Time Based Competition

SESSION 11: TIME BASED COMPETITION

1. Read Chapter 16 in H&R (p. 285-310). Attempt the discussion questions at the end of the chapter.
2. Draw the networks for the projects described in the FCN/Securities Demo (A) exercise (p. 486 in H&R).
3. [Homework #5: T.B.A.](#)

SESSION 12: 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. 487-488 in H&R), Specialty Contractors, and Aerospace Components (p. 492-94 in H&R).
2. [Homework #6: T.B.A.](#)

[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. 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:

Premier Screening of the movie “The Goal” (50 minutes).
Room: T.B.A.

SESSION 13: REVIEW OF COURSE TO DATE

SESSION 14: MIDTERM EXAM

SPRING BREAK RECESS



MODULE 4: Managing Quality as a Strategic Issue

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 Chapter 6 in H&R (p. 67-89)
4. Read the Firestone Tire (p. 496-526 in H&R) case and be prepared to discuss it.

SESSION 16: QUALITY ANALYSIS, MEASUREMENT AND IMPROVEMENT

1. Read the Toyota Motor Manufacturing case and be prepared to discuss it.
2. [Homework #7: T.B.A.](#)

REMINDER: TERM PROJECT 3 DUE SESSION 19

SESSION 17: STATISTICAL QUALITY CONTROL

1. Read the Supplement to Chapter 6 in H&R (p. 97-118).

SESSION 18: QUALITY IMPROVEMENT

1. Read, analyze and be prepared to discuss the quality control issues in the South Tree Electronics case (p. 528-533 in 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 #8: T.B.A.](#)



MODULE 5: Inventory Concepts and Models

SESSION 19: INVENTORY / LOGISTICS

1. Read Chapter 12 in H&R (p. 219-243 in 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? How would you go about improving quality? (3-4 pages).

SESSION 20: THE ROLE OF INVENTORY - THE TRADITIONAL VIEW

1. Read, analyze and be prepared to discuss the Blanchard Company case (p. 591-601 in H&R) using the following study guide questions:
 - a) Determine which costs should be included to perform EOQ/ELS calculations.
 - b) What are the assumptions of EOQ/ELS model that Blanchard has?
 - c) Briefly describe the inventory system designed by Bob and Elliot.
 - d) Evaluate this system by identifying the major advantages and disadvantages.
 - e) What is Blanchard's shortage costs for its products?

REMINDER: TERM PROJECT 4 DUE SESSION 23

SESSION 21: INVENTORY MANAGEMENT UNDER UNCERTAINTY

1. Read Chapter 12 in H&R (p. 243-248 in H&R).
2. Read the Supplement to Chapter 12 in H&R on Just-in-Time systems (p. 263-284 in H&R)
3. Read, analyze and be prepared to discuss the L.L. Bean Inc. case.
4. Get handout with homework #9.

SESSION 22: INVENTORY IN ACTION: THE BEER GAME

THIS CLASS WILL MEET IN LARGER ROOM (T.B.A.), BE ON TIME !!



SESSION 23: SUPPLY CHAIN MANAGEMENT

1. Debrief of the Beer Game
2. Read Chapter 11 and the Supplement to Chapter 11 in H&R (p. 179-217)
3. Read and be prepared to discuss the Dell Direct case (to be distributed in class).
4. Answer the following questions?
What are the operational factors that contribute to Dell's competitive advantage?
5. In your opinion, what should Dell do to keep their competitive advantage?
6. **Homework #9: T.B.A.**

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 6: Time-to-Market & Responsiveness

SESSION 24: THE EFFECTS OF UNCERTAINTY - WAITING LINES

1. Read Quantitative Module D in H&R on Waiting Lines and Queuing Theory (p. 363-382 in H&R).
2. Prepare the sixteen discussion questions at the end of Module D in H&R (p. 385-386).

SESSION 25: QUEUING THEORY IN ACTION

1. **Homework #10: T.B.A.**
2. Read, analyze, and be prepared to discuss the First City National Bank case (p.540-541 in 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.



SESSION 26: AN INTRODUCTION TO SIMULATION

1. Read Quantitative Module F in H&R on simulation (p. 395-408 in H&R)
2. Discussion questions 1,2,4,5,7,10,11,12 and 13 H&R (p. 411)
3. Prepare problem F.1 H&R (p. 412)

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

1. **Homework #11: T.B.A.**
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?

OPTIONAL SESSION: REVIEW OF COURSE TO DATE

Date: T.B.A.

SPECIAL SESSION (T.B.A.)

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 20-minute PowerPoint presentation to be given to the entire class.

FINAL EXAMINATION T.B.A.



GRADING

Class Participation, Attendance	10%
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 (min 3 - max 5) will be formed to undertake a term project as part of the course requirements. Your group will choose a company from a list of pre-selected companies.

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. When discussion questions are involved, please answer briefly (two or three sentences). Homework will be graded, **and will not be accepted late**. They must be prepared individually in order to receive credit.

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.



Details of Project Reports

Term Project 1: Overview of firm and key operational considerations/problems.

Length of the project: 4 pages (double spaced). You may wish to cover the following aspects of organization:

a) Goals of the organization -- try to keep this limited to the local branch or store

- Mission
- Performance till date
- Expected performance (annual and 5-year)

b) Product or service offered-- try to keep this limited to the local branch or store

- What are the Categories or products or services offered
- Sales per category (or what are the major and which are the minor ones)

c) Market

- Estimated share of market
- Expected growth rate of market

d) Competitive strategy

- Competitors profile
- What is different about your firm?

e) Customers

- Who are the customers, where do they come from (local or otherwise), are there regular ones?
- Demographic profile
- Psychographic profile

f) Workers

- Number
- Skill level (or education)
- Training provided by branch or firm
- Maybe an organization chart

g) What does the manager think the top 2-3 issues are with regard to business and with regard to operations? What are your viewpoints about it?



Term Project 2: Process design and process analysis

Length of the project: 4-5 pages (double spaced) – exhibits can be included as appendices

Concepts that may apply: Characteristics of services, design of products/services, analysis of processes.

Suggested methodology:

1. Determine the key success factors for your company.
2. Make an exhaustive list of all processes.
 - a) How are they linked, ordered, etc.?
 - b) What/where/when do they receive raw materials, subassemblies, etc.?
 - c) At what stage of the process are outputs produced?
 - d) How does information flow?
 - e) Is your organization a flow, job or project shop?
 - f) What are the measures of capacity for the organization?
 - g) Do you notice any activities that do not add value to the organization?
3. Choose 1 significant process to study. Discuss it with the TA or the professor. List out the specific objectives for these processes.
4. Draw a process diagram, indicating the inventories and information flows.
5. Analyze the process like we did in Benihana. How is value being created? How does each step of the process support the business -- apply the key success factors. What are the excellent ideas you see in the process steps? Is there scope for improving the process?
6. What is the capacity and throughput time of the process? How can capacity be changed? Can Throughput time be reduced? Is there an example of setup time, lot size? Can set up time be reduced?
7. Draw a layout (a drawing of where the action takes place) and comment on improvements that can be made. A sample layout is shown in the Benihana case. This may not be appropriate for all projects -- please use your judgment.
8. If you had a chance to redo the entire process, what alternate process design would you suggest and why?



Term Project 3: Total Quality Management

This part of the project is more open ended than the rest. You can choose to do some of the following (I suggest the first five and rest optional):

1. Quality has several dimensions: Performance, Features, Reliability, Durability, Serviceability, Response, Aesthetics, Reputation, Safety, Assurance, Empathy,

...

Define quality for your firm's product or service that you studied in part 2 of the project along these dimensions.

2. Take one or two dimensions and ask how will you measure quality along these dimensions? You must specify a method that will yield a quantitative measure. Note that measurement can be done using industry standards, observation, by comparison against a "standard" product or service, as well as by asking customers' for their opinion.

3. Take a particular dimension and actually measure quality.

4. Compare the measurement with a benchmark. How will you get this benchmark? Study competition or use the measures from another process that is known to be excellent.

5. Take a particular step in the process (you have chosen) and ask how you can use SPC (statistical process control) ideas. Does the firm use acceptance sampling? If yes, give an example and provide a critique of their methods.

- Can you make this step fool proof?
- What type of automation will help?
- How can this step be designed to produce zero defects and also give the required capacity?

6. How does the firm's philosophy towards quality relate to what we have learnt in class?

- Is Continuous improvement suitable or should quality be improved in quantum leaps? Which aspects of the firm's products, services and processes are amenable to the use of the continuous improvement philosophy?
- Is ISO 9000 certification important to your firm? Does the firm have a quality system, i.e., a set of written procedures? How recently have these procedures been reviewed? If they do not have written procedures how are they able to ensure consistent delivery of quality service?
- Does the organization's philosophy, use of tools and techniques, and people support the TQM concept? What constructive suggestions would you provide to the firm in this regard?



Term project 4: Inventory Management

This part of the project is all about inventory management at your firm.

1. Can your product or service be inventoried. If yes, how? What is the inventory cost (holding and ordering cost) in your firm? Estimate by sampling. How many weeks of inventory do they keep? Is it same for all items?

2. How does your organization manage inventory? What systems does it use? How does it maintain control and efficiency? You can show forms or describe how they take stock of inventory, do they order every item similarly, how many weeks of stock do they want to carry, etc. What is their safety stock policy? What service level do they aim for?

This is the big part of the report.

3. What policy does it use for replenishment?

When and how they decide to replenish inventory? Is it continuous or periodic review. Should they think of changing the policy?

4. Can you suggest improvements?

I suggest doing an ABC analysis. Determining how much inventory they carry of A, B and C items (total for all A, all B etc). This can be done by estimating (sample a few items and see how much they carry -- extrapolate to the rest).

Compute some inventory turns for the sample items.

See if you can help reduce inventory or even increase if you think it is important. For this, try applying EOQ for a few sample items.

4. How would you implement the Just in Time philosophy for your environment?

Does it make sense to do this? Can the vendors manage inventory?

5. Should you implement cycle counting? Do they use it? What is the accuracy of inventory records (difference between actual inventory and inventory on the books).