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 for products and services.

We will meet over 14 consecutive weeks. Attendance in all sessions is required for full credit.

Instructor: Dr. Mor Armony,
Room KMC 8-62, (212) 998-0291
marmony@stern.nyu.edu

Office hours:

Teaching Fellow:

Office hours:

Meetings:

Required Course Materials (available via NYU bookstore):

Cases and Readings:
- Xanedu Digital Course-pack (also, some cases will be distributed in class, and some can be downloaded from NYU Classes)
- Operations Management Simulation: Benihana V2 to be purchased through HBSP website via the link: http://cb.hbsp.harvard.edu/cb/access/15115439 (You will need to open a student account, if you do not have one yet).


Computer Software: Excel

Optional Course Material (also available in bookstore)

Custom Text: A customized version with selected chapters from Operations and Supply Management; Jacobs, Chase, and Aquilano; 14th Edition; McGraw-Hill;
Grading:

Class Attendance & Participation: 10%
Case Assignments (8): 10%
Problems sets (3): 25%
Midterm exams (2): 30%
Final exam: 25%

Attendance and Participation: Attendance is required in all class sessions for full credit. Students are also expected to participate in class discussion and other in-class activities. The use of computers and other electronics is not allowed during class sessions (with the exception of a few class sessions, in which we will be specifically using laptops). If you would like to use your laptop for the purpose of note taking, please discuss with the instructor.

Case Assignments: There are 8 case assignments. These may be prepared in groups of up to 4 people. One copy per group per assignment needs to be submitted at the beginning of the class session. Page limit: 2 page, 11pt, double spaced.

Problem Sets: In addition to case assignments, there will be 3 assigned problem sets. These need to be prepared individually. Students may discuss the problems with others, but writing the report should be done alone.

Midterm Exams: The two midterm exams will test you on all the material covered in the entire class up to their date. The exams are open books and open notes, and you will need a calculator.

Final Exam: The final exam will test you on all the material covered in the entire class. The exam is open books and open notes, and you will need a calculator.
COURSE OVERVIEW AND OBJECTIVES

Operations Management is the design and management of the processes that transform inputs into finished goods or services. Operations is one of the primary functions of a firm. Whereas marketing focuses on the demand for the product, and Whereas finance provides the capital for the product, operations actually produce and deliver the product.

This course provides a foundation for understanding the operations of a firm. Our objective by the end of the course is to provide you with the basic skills necessary to critically analyze a firm's operating performance and practices. Such knowledge is important for careers in a variety of areas, including general management, entrepreneurship, investment banking (e.g. business restructurings, mergers and acquisitions), venture capital (e.g. evaluating new business plans) and management consulting (business restructuring improvement).

Unlike many courses in the core, 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". In contrast to your management courses, our focus is on the technological rather than human dimension of a firm's internal operations - though there are obvious connections between the two that we will explore. In contrast to the measurement focus of your accounting courses, our concern is to understand what elements of a firm's operations enable it to produce quality outputs at a competitive cost structure. That is, we will focus on how the "physics" of material, work and information flows and the design and management of a firm's processes interact to determine a firm's cost structure and its ability to compete effectively in terms of non-cost measures such as quality, variety and speed.

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 industries. These concepts are then illustrated using cases from a diverse set of businesses.
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NYU STERN CODE OF CONDUCT

I expect every student to be familiar with the NYU Stern Code of Conduct http://www.stern.nyu.edu/cons/groups/content/documents/webasset/con_036267.doc. Some of the ways in which the code applies to this course are discussed below:

- The code of conduct stipulates that a student will “exercise integrity in all aspects of our academic work including, but not limited to, the preparation and completion of exams, papers and all other course requirements by not engaging in any method or means that provides an unfair advantage.”
- 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 code of conduct to include his or her name.
- Furthermore, you may not refer to write-ups from classes offered in earlier semesters.
- The premise of the code of conduct 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, TA, the textbooks or the lecture notes, you must acknowledge the source. For example, say, “I obtained this from the following website: …”
- You may discuss the homework with your classmates, TA or the Professor. However, you must write them down individually (excluding case assignments which are to be prepared in groups of up to 4 students). The discussion is limited to “how to solve” type of questions. Do not be concerned about getting a wrong answer in the case assignments. These will be graded based on effort. The problem sets will be graded based on effort and correctness.
Session 1: *Introduction to Operations Management*

- **Readings:**
  - (Optional) Read chapter 1: Introduction to the Field (JCA).

- **Homework due:**
  - Submit your personal information form (NYU Classes)

Session 2: *Process Strategy*

- **Case:** *Benihana of Tokyo*, W.E. Sasser, 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.)
  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). Justify your answers.*

- **Readings:**
  - Read the note “Analysis of an Operation”.

Session 3: *Process Design*

  1. In preparation for class please view the “How to Play” video, and complete challenge 1.
  2. (In class) Complete challenges 2 to 6 of the simulation
  3. (In class) Prepare a report (max two pages in length) with a summary of your recommendations for challenge #6. Explain your proposed operating strategy and expected financial performance.

*Please bring a laptop.*

- **Readings:**
  - (Optional) Read chapter 6: Process Analysis (JCA).

Session 4: *Process Flow Analysis*

- Flow Diagram
- Capacity, Throughput Time, Cycle Time
• **Case:** *Kristen's Cookie Company*, R. Bohn, Harvard Business School (2006). Read, analyze, and be prepared to discuss the Kristen's Cookie Company (A) case, utilizing the six key questions at the end as guides.

**Case Assignment #2: (Due at the Beginning of Class)**
*Identify all possible bottleneck operations in Kristen's process. Explain.*

**Session 5: The Effects of Uncertainty—Waiting Lines & Queueing Theory**
- Characteristics of a Waiting-Line System
  - Arrival, Waiting Line, Service Characteristics
  - Measuring the Queue’s Performance
  - Queueing Costs

**Readings:**
- Read *Queueing Management and Models*, Columbia Business School (available on NYU Classes)
- (Optional) Read Chapter 8A in JCA: Waiting Line Analysis

**Session 6: Waiting Lines & Queueing Theory**
- Multiserver queues
- Psychology of Queues

• **Case:** *The BAT Case: Putting Tech Support on the Fast Track*, M. Lariviere, Kellogg (2007). Read, analyze, and be prepared to discuss the case, utilizing the seven key questions at the end as a guide.

**Case Assignment #3: (Due at the Beginning of Class)**
*Answer questions 1), 2) and 5).*

**Session 7: Waiting Lines & Queueing Theory + Introduction to Simulation**
- Server Pooling
- Priority Queues
- Queueing Theory in Practice

• **Case:** Read, analyze, and be prepared to discuss *First City National Bank case*. The following study questions will help:
  a) Considering the date 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 queueing system would you be most interested in observing?
  c) What is the best number of tellers to use?
Session 8: *Simulation*

- **Readings:**
  a. (Optional) Read Chapter 19A in JCA: Simulation
  b. (Optional) Practice the Monte-Carlo Technique using Solved problems 1 and 2 (p. 667-668 in JCA).

- **Case Assignment #4: (Due at the Beginning of Class)**
  For the First City National Bank case,
  a. simulate by hand the first 25 arrivals into the system under the following two configurations:
     1. Three parallel queues, one server per queue
        (assume a cyclical arrival pattern)
     2. A single line with three servers.
  b. Which configuration performs better? In what way?

Please bring a laptop.

Session 9: *Midterm review I*

- Review of material covered up to date.

  **Submit Problem set #1**

Session 10: *Midterm Exam I*

- Open books
- Open notes
- Please bring a calculator

Sessions 11: *Quality Management*

- Quality Analysis, Measurement and Improvement
- Six Sigma

- **Readings:**
  o (Optional) Read Chapter 9 in JCA: Six-Sigma Quality
  o (Optional) Read Chapter 9A in JCA: Process Capability and SPC.

- **Case:** Read, analyze, and be prepared to discuss *The Ritz Carlton Hotel Company: The Quest for Service Excellence*, by N. Fraiman, L. Green, G. Van Ryzin and A. Heching, Columbia Business School (2008).

  - **Case Assignment #5: (Due at the Beginning of Class)** Submit your solution to questions posted on NYU Classes.
**Sessions 12: Quality Management**
- Control Charts
- Quality Management in Financial Services

- **Case:** Read, analyze and be prepared to discuss the two cases that deal with TQM in Financial Services: Part A: First National City Bank – The Credit Card Division and Part B: Smith-Thompson Investment Bank.

Please bring a laptop.

**Sessions 13: Quality Management**
- Process Improvement

- **Case:** Read, analyze and be prepared to discuss the Universal Printing Company (UPC) (A) case. Use the following study questions as an aid in analyzing the case:
  - What are the major challenges that UPC is facing in terms of product development and future growth?
  - If you had 5 minutes of Kelly’s time, what would be your recommendations to avoid another Renaissance fiasco?

- **Case Assignment #6: (Due at the Beginning of Class)** Submit your answers to the UPC (A) case questions.

**Sessions 14: Quality Management**
- Process Improvement

  - Recap of UPC case and simulation
  - Process Improvement and six-sigma

**Session 15: Optimal Resource Allocation**

- Linear Programming
  - Models and Applications
  - Graphical Solution Method

- **Readings:**
  - Read Introduction to Linear Programming (available on NYU Classes)
  - (Optional) Read Chapter 2A: Linear Programming Using the Excel Solver

**Session 16: Optimal Resource Allocation**

- Linear Programming
  - Linear Programming using Excel Solver
  - Sensitivity Analysis and Shadow Prices
Please bring laptops.

**Session 17: Optimal Resource Allocation**
- Linear Programming in practice

**Session 18: Project Management**
- Project Management
- CPM
- Crashing the project

- **Readings:**
  - (Optional) Read Chapter 3 in JCA: Project Management

- **Case:** In preparation for class, read and be prepared to discuss the projects in FCN/Securities Demo (A) and (B) and Allied Distributing exercises.

**Session 19: Project Management**
- Project Management Under Uncertainty
- PERT

**Session 20: Midterm review II**
- Review of material covered since last midterm and up to date.

Submit Problem set #2

**Session 21: Midterm Exam II**
- Open books
- Open notes
- Please bring a calculator

**Session 22: The Beer Game**
- A Supply Chain Simulation

**Session 23: Supply Chain Management**
- Supply Chain Management
- The Bullwhip Effect

- **Readings:**
  - (Optional) Read Chapter 10 in JCA: Supply Chain Strategy
Session 24: *Inventory Management*

- Importance of Inventory
- Inventory Measures
- Economic Order Quantity (EOQ)
- Inventory Pooling

**Readings:**
- (Optional) Read Chapter 17 in JCA: Inventory Control

**Case:** *Xenon Drives*. Read, analyze and be prepared to discuss the Xenon Drives case.

**Case Assignment #7: (Due at the Beginning of Class)**

Comment on Allen’s Claim: “I can’t see why it requires any more inventory to keep one month’s supply on hand in four branches than it did to keep a month’s supply on hand back at just the factory’s warehouse. A Month’s supply is a month’s supply no matter how you look at it.”

Session 25: *Short lifecycle products*

- Newsvendor Model
  - (Optional) The newsvendor model (Pages 551-552 in JCA)

**Case:** Read and be prepared to discuss the *L.L. Bean, Inc* case.

**Case Assignment #8: (Due at the Beginning of Class)**

With respect to the L.L. Bean case, please answer the following three questions:

1. How does L.L. Bean use past demand data and a specific item forecast to determine how many units of that item to stock?

2. What item costs and revenues are relevant to the decision of how many units of that item to stock?

3. How would you address Mark Fasold's concern that the number of items purchased usually exceeds the number forecast?

Session 26: *The Goal & Final Review*

- The Goal
- Final Review

**The Goal:** Read up to page 264
Discussion of “The Goal”
   a. How does production control work in Alex’s factory? More specifically, given a set of orders to be produced, what is the scheme by which work is released to the factory? What is the scheme by which work is prioritized at each process step?
   b. What steps did Alex take to improve performance (as measured by the goal) in his factory?
   c. What are the weaknesses in the message of The Goal?

   • Review of material covered in the entire course.

Submit Problem Set #3

Session 27: Final exam
   o Open books
   o Open notes
   o Please bring a calculator
   o Cumulative