



NYU Stern School of Business
OPERATIONS MANAGEMENT
COR1-GB.2314.W2
WINTER INTENSIVE 2014

[SYLLABUS DRAFT — INDICATIVE OF THE SYLLABUS FOR THE COURSE]
INSTRUCTOR DETAILS

JAGABATHULA, SRIKANTH
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 Office hours: By Appointment
 Office location: KMC 8-74

COURSE MEETINGS

Saturday, 18-Jan-2014	9 am — 4 pm	KMC 5-90
Sunday, 19-Jan-2014	9 am — 4 pm	KMC 5-90
Saturday, 25-Jan-2014	9 am — 4 pm	KMC 5-90
Sunday, 26-Jan-2014	9 am — 4 pm	KMC 5-90
Saturday, 01-Feb-2014	9 am — 4 pm	KMC 5-90
Sunday, 02-Feb-2014	9 am — 4 pm	KMC 5-90

TEACHING ASSISTANT

BRITWISTLE, DARRYL
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COURSE WEBSITE

<http://newclasses.nyu.edu>

COURSE OVERVIEW

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

This course is intended to provide students a better understanding of how firms can gain competitive advantage from their operations function. Typically this requires the firm to achieve, at a minimum, cost, quality, and ecological parity; responsiveness and adaptability to customer needs and desires; rapid time to market; process technology leadership; and sufficient and responsive capacity. The course is designed to develop a problem-solving framework that enables students to undertake managerial and technical analysis of operations that should result in the desired comparative advantage. 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, I 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.

The course will be a combination of lectures, case discussions, and hands-on workshops interspersed with the lectures, and games. The lectures will provide high-level operations concepts, case discussions will provide business scenarios where we apply the concepts, and the hands-on workshop will be devoted to applying the more technical concepts. The games will provide real-world decision making scenarios that provide an opportunity to apply concepts learned in the class in a fun and competitive setting.

LEARNING GOALS

By the end of the course, the student should

1. Be able to think about operations strategy not just in isolation, but in the context of the entire firm strategy

2. Develop the ability to use the appropriate framework to reason through and fix firms operational problems
3. Gain an understanding of standard operations tools and terminology
4. Gain the ability to perform quick “back-of-the-envelope” calculations for operational metrics
5. Be able to understand the impact of demand and process variability in manufacturing and service industries

COURSE DETAILS

REQUIRED MATERIAL

The following cases need to be purchased from Harvard Business Publishing:

1. Benihana of Tokyo
2. Kristen Cookie Company
3. Zara, Fast Fashion (HBS)

Please go to <https://cb.hbsp.harvard.edu:443/cbmp/access/23525842> to order a copy of this e-packet.

Other 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 for each class.

RECOMMENDED (OPTIONAL) MATERIAL

The following additional references and material is recommended, but optional:

- Custom text: A customized version with selected chapters from Operations & Supply Management; Chase, Aquilano, and Jacobs; Thirteenth Edition; McGraw-Hill Irwin; 2011. Available in NYU bookstore.
- The Goal: “*The Goal: A Process of Ongoing Improvement*,” third revised edition (buy in bookstores) by Eliyahu Goldratt and Jeff Cox, North River Press, Inc. 2004
- *Operations Management for Competitive Advantage* (Tenth Edition), By Chase, Aquilano, and Jacobs, McGraw Hill Irwin
- *Designing and Managing the Supply Chain: Concepts, Strategies, and Cases*, by David Simchi-Levi, Philip Kaminsky, and Edith Simchi-Levi, McGraw-Hill Irwin

COURSE SOFTWARE

MS EXCEL

ASSESSMENT COMPONENTS

Student's performance in the course will be assessed based on class participation, homework assignments, and exams.

Participation: In-class contribution is a significant part of your grade and an important part of our shared learning experience. Students are expected to do all the assigned required reading and contribute via insightful comments and questions. Student participation is especially crucial during case discussions. Students will be judged on the quality of their contribution, which reflects the depth of their understanding.

Homework assignments: There are two homework assignments that need to be turned in. The assignments constitute case assignments and problems. Detailed instructions on how to complete the assignments will be provided with each homework assignment. Keep a copy for your reference during class. Show all your work if your response requires a calculation.

Exams: The course will have one in-class final exam that will be given in the last session. The final exam constitutes 40% of your grade and will cover all the material covered in the class. **The exam itself will be open book/notes.** Practice problems, study notes, and a practice exam will be provided to aid students' preparation.

GRADING COMPONENTS

The following is the break down of the grading:

- Class participation, attendance 20%
- Homework assignments 40%
- Final exam 40%

ATTENDANCE AND LATENESS

Attendance is mandatory for the course. Students are expected to be present for all sessions. 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, smart phones & other electronic devices **must not be used** in class.

OVERVIEW OF THE SCHEDULE (subject to minor changes)

The class is divided into 12 sessions — each 3 hours long. The following is the overview of the schedule.

Session number	Topic	Date/Time	Deliverable
Session 1	Process Analysis: Benihana of Tokyo	18-Jan-2014 Morning	
Session 2	Process Analysis: Kristen's Cookie Company	18-Jan-2014 Afternoon	
Session 3	Waiting line analysis	19-Jan-2014 Morning	
Session 4	Linear Programming	19-Jan-2014 Afternoon	
Session 5	Inventory Management: Inventory Management at CVS	25-Jan-2014 Morning	Homework 1 Due
Session 6	Inventory under Uncertainty: Newsvendor model	25-Jan-2014 Afternoon	
Session 7	Revenue Management: Yield management at break.com	26-Jan-2014 Morning	
Session 8	Project Management	26-Jan-2014 Afternoon	
Session 9	SCM: Zara Fast Fashion	01-Feb-2014 Morning	Homework 2 Due
Session 10	SCM: Beer game	01-Feb-2014 Afternoon	
Session 11	Quality control	02-Feb-2014 Morning	
Session 12	Final exam	02-Feb-2014 Afternoon	Final Exam

DETAILED SYLLABUS (subject to minor changes)**18-Jan-2014 Morning****Session 1: Introduction – Operations as a source of competitive advantage**

The first session will provide an overview of why operational strategy is core to the firms overall strategy, and why it is essential for success to design an operational strategy that is aligned with the product strategy. We will analyze the “Benihana of Tokyo” case to understand these concepts. This session will also introduce the concept of a “business process,” which is core to any operations analysis.

The main objective of this session is to get a bird’s-eye view of operations and understand its role in the success of a business.

Readings

Required:

1. “Terms used in Operations Management,” posted on course website
2. Read, analyze, and be prepared to discuss the Benihana of Tokyo case. Use the following questions as an aid in analyzing the case.
 - a. Describe Benihana as an operations system. Identify the various processes that are part of the system.
 - 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 the number of seats in the bar? Assume they want the average customer to stay 18 minutes in the bar.

Optional:

1. “Unsung Heroes,” posted on course website
2. “Principles of Scientific Management,” posted on course website
3. Begin reading “The Goal” by E. M. Goldratt

18-Jan-2014 Afternoon

Session 2: Process analysis: Process capacity, cost, and time (Kristen Cookies Case)

This session will cover the core concepts of a process. A “business process” is the most fundamental unit of operations. Operational analysis can be broken down to the analysis of individual business processes.

The main objective of the session is to pick up useful tools and techniques to analyze a business process to determine process capacity, process cost, service time, bottlenecks, scheduling labor, and executing orders. We will also learn flow diagrams, Gantt charts, and how order size, resources, and setup times affect throughput of the process. We will use the simple setting of Kristen’s Cookie Company to pick up these tools and techniques.

The session will also provide insights into capacity management techniques that are used in every day business.

Readings

Required:

1. Read, analyze, and be prepared to discuss the “Kristen’s Cookie Company” case utilizing the six key questions at the end as guides. In particular, what are the cycle time, throughput time, and capacity of each operation and the whole production system?
2. Read “Analysis of an Operation,” posted on the course website.

Optional:

1. “Process Flow Analysis,” posted on the course website

19-Jan-2014 Morning

Session 3: Dealing with uncertainty: why queues form, queuing models, waiting time analysis, and psychological aspects of queuing.

This session is geared towards understanding the effects of uncertainty on operations. Real-world processes are seldom deterministic and several factors introduce uncertainty creating a mismatch between demand and supply. This mismatch creates special problems for managers. In order to understand these

problems, it is important to understand the time-scale at which these uncertainties happen. Very long and gradual changes in demand can be dealt with using techniques for managing seasonal demand. Medium-term uncertainties, such as day-to-day fluctuations in demand levels, can be dealt with using staffing solutions and overtime. Demand uncertainties that are on the *same* timescale as operational variables such as processing time or setup time need special techniques. These techniques are called waiting line or queuing techniques.

The goal of this session is to understand how variability in demand and service times leads to buildup of queues. It covers queuing models, the effects of pooling servers, the non-linear relationship between waiting time and server load, and psychological aspects of waiting. The queuing models will help us to analytically compute queuing delays and how to plan extra capacity to reduce unwanted delays.

Readings

Required

1. “Managing Real and Virtual Waits,” Duncan Dickson, Robert Ford, and Bruce Laval, available on course website

Optional:

1. “Queuing management and models,” Linda Green and Garrett van Ryzin, available on course website
2. “Allocating Telecommunication Resources at L. L. Bean, Inc.” Phil Quinn, Bruce Andrews, and Henry Andrews, available on course website
3. “Using call centers to boost revenue,” McKinsey Report, available on course website
4. “Prescription for the waiting-in-line Blues: Entertain, Enlighten, and Engage,” Karen Katz, Blaire Larson, and Richard Larson, available on course website
5. “Queuing Psychology: Can Waiting in Line be Fun?” CNN article, available on course website
6. “Larry David on Waiting in Lines” available on YouTube at <http://www.youtube.com/watch?v=xrWiWrhID4o>

19-Jan-2014 Afternoon

Session 4: Linear Programming, solution techniques (graphical method, enumerating corner points, and excel), and sensitivity analysis

This session will introduce the invaluable tool of linear programming (LP), which is a workhorse of industry to solve large-scale problems, where common sense and intuition are not sufficient. We will understand how to map practical problems into LPs, and learn intuitive methods such as graphical method and enumeration of corner points to solve small sized LPs and the excel solver method for large sized LPs. Finally, we will do “sensitivity analysis” that will allow us to predict the impact of changes in the problem parameters.

Readings

Required:

1. “Introduction to Linear Programming,” posted on the course website.

25-Jan-2014 Morning

Session 5: Inventory Concepts and EOQ model

This session will introduce the basic concepts in inventory management. Inventory is a fundamental lever for managing the operations of a company. For many companies inventory constitutes a significant portion of *total assets* (for instance, 40% of Best Buy’s total assets in 2011 was inventory). Due to the high monetary investments associated with inventory, efficient inventory management becomes a crucial weapon for gaining competitive advantage.

The goal of this session is to introduce basic concepts of inventory management and useful aggregate metrics to assess the inventory performance of a company (a la P/E ratios). We will also introduce the workhorse of inventory models – the EOQ model. Using the lens of the EOQ model, we will understand the effect of centralization on inventory costs.

In addition, the session will introduce the basics of *supply chain management* (SCM). Material, information, and funds flow through supply chains. Demand is matched with supply, orders with fulfillment, and products are planned to fill customer needs and to compete against other products in the market. The integrated management of the three flows – material, information, and funds – is called supply chain management. We will the basic components and terminologies related to supply chains.

Readings

Required:

1. Read and be prepared to discuss the “J&J CVS Caremark” case. Please use the questions provided at the end as a guide when reading the case.

25-Jan-2014 Afternoon

Session 6: Inventory Under Uncertainty: Newsvendor model

In this session, we study the effect of demand uncertainty on inventory decisions. Demand uncertainty makes inventory planning harder. We will learn how to think about optimal stocking levels when the demand distribution is known and inventory is perishable. This for instance is relevant in many settings such as selling seat inventory in an aircraft, room inventory in a hotel, etc. We will introduce the newsvendor model as the analysis tool for these settings.

26-Jan-2014 Morning

Session 7: Revenue Management

Revenue Management deals with the science of selling the right item to the right person at the right time and at the right price. It deals with settings in which capacity is limited, demand is uncertain, and price is not a signal for quality. Airline seats, hotel rooms, opera tickets, etc. are all examples of such settings. Given this, price is used as a lever for maximizing revenues by unlocking customer surplus. The session is geared towards introducing core concepts of revenue management and applying these concepts to the problems of markdown in retail and online ad optimization at break.com. We will also play a ‘markdown’ game.

Readings

Required:

1. Read and be prepared to discuss the “Break.com” case. Please use the questions provided at the end as a guide when reading the case.

26-Jan-2014 Afternoon

Session 8: Time-based competition

This session is focused on discussing the value of time-based competition. Competing based on time means being able to execute large projects, on time and within cost. Successful project management involves planning and managing the time to complete the project, monitoring the use of resources during project execution, and increasing the probability of successful completion.

The goal of this session is to introduce network techniques for planning and managing large projects. We will also discuss probabilistic methods for project analysis, project crashing (why it is sometimes beneficial to reduce project duration even though it may increase project cost), and optimal reduction of the duration of the project by selectively reducing the duration of only certain activities.

Readings:

Optional:

1. Examples of state-of-the-art network planning tools: <http://www.primavera.com/>
2. Not all projects are successful. Some examples of major engineering project failures in the last century:
 - a. Denver airport
http://www.eee.bham.ac.uk/dsvp_gr/roxby/ee4a3/Lecture2/index.htm
<http://www.prenhall.com/divisions/bp/app/alter/student/useful/ch13denver.html>
 - b. Challenger:
<http://www.tsgc.utexas.edu/archive/general/ethics/shuttle.html>
<http://history.nasa.gov/sts51l.html>

01-Feb-2014 Morning

Session 9: Introduction to Supply Chain Management and Zara — Fast Fashion

The session will introduce the basics of *supply chain management* (SCM). Material, information, and funds flow through supply chains. Demand is matched with supply, orders with fulfillment, and products are planned to fill customer needs and to compete against other products in the market. The integrated management of the three flows – material, information, and funds – is called supply chain management. We will the basic components and terminologies related to supply chains.

We will also discuss “Zara: Fast Fashion” case. We will discuss how Zara distinguishes itself and gains competitive advantage through an effective design of supply chain that supports its product strategy. We will also discuss how Zara’s supply chain affects its gross and operating margins when compared to its competitors.

Readings

Required:

1. Read, analyze, and be prepared to discuss the case “Zara: Fast Fashion.” Use the following questions as an aid in analyzing the case:
 - a. What is Zara’s 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?
 - d. In your opinion, what should Zara do to keep its competitive advantage?

01-Feb-2014 Afternoon

Inventory and Supply Chain Management in action: Beer Game

In this session, we will play the “Beer Game.” Beer Game is designed to illustrate the “bullwhip effect” that is commonly observed in practice in supply chains. We will then draw inferences on supply chain performances from the Beer Game.

Readings

Required:

1. “What is the right supply chain for your product,” Marshall Fisher, available on course website

Optional:

1. “The Triple-A Supply Chain,” Hau Lee, available on course website
2. “Dell, It Turns Out, Has a Better Idea Than Ford,” NY Times, available on course website

02-Feb-2014 Morning

Session 11: Quality as a strategic issue, six-sigma, and statistical quality control

In this session, we introduce quality management concepts. We define quality and raise questions about managing quality in the age of super-mass production. We will also discuss how to manage the interaction between what a process can deliver and what a customer wants. We will learn useful quality management tools such as the fishbone chart, Pareto analysis, and process control charts.

Readings

Optional:

1. “The ‘Six Sigma’ Factor For Home Depot,” Wall Street Journal, available on course website
2. “Decoding the DNA of the Toyota Production System,” Steven Spear and Kent Bowen, available on course website
3. “Toyota Losing its Shine,” The Economist, available on course website

02-Feb-2014 Afternoon

Session 12: Final Exam

ADDITIONAL INFORMATION

HONOR CODE: Please review the MBA Stern Honor Code:
<http://w4.stern.nyu.edu/emplibrary/Honor Code rev.pdf>

ACADEMIC ACCOMMODATION

If you have a qualified disability and will require academic accommodation during this course, please contact the Moses Center for Students with Disabilities (CSD, 212 998-4980) and provide me with a letter from them verifying your registration and outlining the accommodations they recommend. If you will need to take an exam at the CSD, please keep in mind that you must submit a completed Exam Accommodations Form to them at least one week prior to the scheduled exam time to be guaranteed accommodation.

RECORDING OF CLASSES

Your class may be recorded for educational purposes.