DRAFT
Operations Management
Course Syllabus COR1-GB.2314.22 (Spring 2017)

COURSE DESCRIPTION:
This course serves as an introduction to Operations Management. 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.

Instructor:  Dr. Mor Armony,
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marmony@stern.nyu.edu
Office hours: By appointment

Teaching Fellow: TBA
Office hours:
• TBA

Meetings: Wednesday, 1:30 – 4:20pm
Room: KMC 3-50

Required Course Materials:

Cases and Readings:
• The Goal: A Process of Ongoing Improvement”, third revised edition), by Eliyahu Goldratt and Jeff Cox, North River Press, Inc.
• Digital Course Pack

Computer Software: Microsoft Excel

Optional Course Material (available in bookstore)


Grading:

Class Participation: 10%
Case Assignments (7): 10%
Problems sets (4): 25%
Midterm Exam: 25%
Final exam: 30%
**Attendance:** Students are allowed to miss up to one class session for full credit. Missing 2 class sessions drops the grade by half a point (e.g. from A to an A-), missing 3 class sessions drops the grade by a full point (e.g. from A to B). Missing 4 class sessions or more is not permitted.

**Participation:** Students are expected to participate in class discussion and other in-class activities. The use of computers and other electronic devices 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. Students are also encouraged to participate through discussions on ForClass.

**Case Assignments:** There are 7 case assignments. They should be submitted individually (please feel free to discuss with your classmate). Most submissions will be done through ForClass. Grading: √ or √-, based on effort. All ForClass assignments should be submitted by 10AM prior to class.

**Problem Sets:** In addition to case assignments, there will be 4 assigned problem sets. These may be prepared in groups of up to 4 people. One copy should be submitted per group. Grading will be based on effort as well as correctness.

**Midterm Exam:** The midterm exam will test you on all the material covered up to that moment. The exam is closed books. You are allowed to bring one page of notes (double sided is fine). 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 closed books. You are allowed to bring one page of notes (double sided is fine). 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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<td>Benihana of Tokyo</td>
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<td>Process Analysis &amp; Waiting Lines</td>
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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 & Process Strategy and Design

Session 2: Process Analysis & Capacity Management in Services

- **Topics:**
  - Flow Diagram
  - Capacity, Throughput Time, Cycle Time
  - Bottleneck

- **Readings:**
  - Read the note “Analysis of an Operation”.
  - (Optional) Read chapter 1: Introduction (JC).
  - (Optional) Read chapter 3: Design of Products and Services (JC).
  - (Optional) Read chapter 11: Process Design and Analysis (JC)

- **Video Tutorials:**

*Homework due (by 10AM prior to class):*
- Submit your Student Information Form
- Case Assignment #1: Panama Canal
- Case Assignment #2: Kristen’s Cookies

Session 3: Single- and Multi-server Queues & Economies of Scale and Priorities in Queues

- **Topics:**
  - Sources of Delays in Services
  - Process Variability
  - Single Server Queue
  - Multi-server queue
  - Effect of pooling

- **Readings:**
  - Read Queueing Management and Models, Columbia Business School (available on NYU Classes)
  - (Optional) Read Chapter 10, Pages 221-241: Waiting Line Analysis and Simulation (JC)

- **Video Tutorials:**

Submit Problem Set #1
Session 4: *Waiting Lines and Simulation*

- **Readings:**
  - (Optional) Read Chapter 10, Pages 241-248: Waiting Lines Analysis and Simulation

- **Video Tutorials:**

- Please bring a laptop.

- **Case Assignment #3:** First City National Bank case (ForClass: Due by 10AM prior to class)

Session 5: *Project Management*

- Introduction to Project Management
- Critical Path Method
- Crashing the project
- PERT: Program Evaluation and Review Technique
- Project Management under uncertainty

- **Readings:**
  - Read Critical Path Method Applied to Research Project Planning (NYU Classes)
  - (Optional) Read Chapter 4: Project Management (JC)

- **Video Tutorials:**

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

Session 6: *Quality Management*

- **Topics:**
  - Quality Definition, Measurement and Improvement
  - Six Sigma
  - Statistical Process Control
  - Control Charts
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• **Readings:**
  - Read Statistical Process Control (NYU Classes)
  - (Optional) Read Chapter 12: Six-Sigma Quality (JC)
  - (Optional) Read Chapter 13: Statistical Quality Control (JC).

• **Video Tutorials:**
  - Watch ‘Quality: Introduction’ ([http://youtu.be/3HBx_N7_tz0](http://youtu.be/3HBx_N7_tz0))

**Case Assignment #4: The Ritz Carlton Hotel (ForClass: Due by 10AM prior to class)**

Session 7: *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 #5: (Due at the Beginning of Class)** Submit your answers to the UPC (A) case questions.

Submit Problem Set #2

Session 8: *Midterm exam*

Closed books. One page of notes is permitted (double sided). Please bring a calculator.

Session 9: *Optimal Resource Allocation: Linear Programming Allocation*

- Models and Applications
- Graphical Solution Method
- Linear Programming using Excel Solver
- Sensitivity Analysis and Shadow Prices

• **Readings:**
  - Read Introduction to Linear Programming (available on NYU-Classes)
  - (Optional) Read Appendix A: Linear Programming using the Excel Solver (JC)
• **Video Tutorials:**
  - Watch 'Introduction to Optimization Modeling' ([https://www.youtube.com/watch?v=uMRo4W4ljJw](https://www.youtube.com/watch?v=uMRo4W4ljJw))
  - Watch 'Introduction to Solver' ([https://www.youtube.com/watch?v=nQT8u3HXRBY](https://www.youtube.com/watch?v=nQT8u3HXRBY))

• Please bring a laptop.

**Session 10: Optimal Resource Allocation & The Goal**

• Linear Programming
  - Application to Real Estate

• **Case:** Read and be prepared to discuss *Otto Development case* (NYU Classes). The following study questions will help:
  - In order to formulate this real-estate development problem as a linear programming
    - What are the decision variables?
    - What is the objective function?
    - What are the constraints?

• **Readings:**
  - Complete reading *The Goal* (at least up to page 264)
  - (Optional) Read Chapter 23: Theory of Constraints (JC)

  **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*?

• Please bring a laptop.

**Session 11: Supply Chain Management: The Beer Game (meet in Abbe-Bogen KMC 11th floor)**

  - A Supply Chain Simulation

• **Readings:**
  - (Optional) Read Chapter 14: Lean Supply Chains (JC)
Session 12: *Inventory Management*

- Importance of Inventory
- Inventory Measures
- Economic Order Quantity
- Newsvendor Model

**Readings:**
- Read The Economic Order-Quantity (EOQ) Model (NYU Classes)
- (Optional) Read Chapter 20: Inventory Management (JC)

**Video Tutorials:**
- Watch ‘Inventory: Introduction’ ([http://youtu.be/kGPr9oeN0MQ](http://youtu.be/kGPr9oeN0MQ))

**Case Assignment #6: L.L. Bean case (ForClass: Due by 10AM prior to class)**

Session 13: *Revenue Management & Final Review*

**Video Tutorials:**
- Watch ‘Revenue Management: Introduction’ ([http://youtu.be/yutHhJgSC-4](http://youtu.be/yutHhJgSC-4))

**Case Assignment #7: Blue Sky Airlines (ForClass: Due by 10AM prior to class)**

Submit Problem Set #4
Final Exam: TBA

Closed books. One page of notes is permitted (double sided). Please bring a calculator.