

**Columbia University Graduate School of Business**

**Operations Management & Strategy Summer 2019**

**Nelson M. Fraiman**

**212 854 2076 [telephone]**

nmf1@columbia.edu

**400 Uris Hall**

# COURSE OBJECTIVES AND OVERVIEW:

**Introduction**

Operations Management is concerned with the design, management, improvement and institutionalization of the processes that transform inputs into goods or services. Operations Strategy looks into a firm’s leadership, technology, processes, systems and people and aligns it with the operations and the rest of the strategies of the firm.

Operations is one of the primary functions of a firm. As marketing induces the demand for products and finance provides the capital, operations produce the product (goods and services).

The objective of the course is to provide you with the basic skills necessary to critically analyze a firm's operating performance and practices. 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 understanding 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, flexibility, variety and speed.

The specific course objectives are to teach you to:

* Identify the operational capabilities needed to support a business strategy;
* Define and characterize key business processes;
* Establish a coherent operations strategy with clear performance objectives and process measures;
* Understand the impact of demand and process variability; and
* Use data and tools to evaluate and improve the efficiency and effectiveness of processes.
* Understand what makes a good operations strategy – what wins orders

Consistent with a managerial perspective and approach, the application, rather than the derivation of models will be emphasized. The course thus strives to provide a balance between a qualitative approach and an analytical, applications-oriented, approach. In that spirit, both the strategic and the tactical dimensions of operations management will be addressed.

# Course Tools:

Various educational approaches and learning tools will be utilized in the course. Conceptual readings and empirical studies in the form of journal articles and book chapters will provide the conceptual foundations and frameworks for dealing with the topics covered. Since the management of operations involves managing complex systems composed of people, equipment, materials, and information, there is rarely a single "best" solution for a problem. Thus we will be using case studies extensively to discuss the various dimensions of a problem and the trade- offs among alternative approaches in an attempt to reinforce the concepts learned through the reading materials and lecture notes.

# Reading Material:

Assigned material should be read before class to facilitate comprehension, discussion, and coverage. Many of the readings are short, and some you will be asked to merely skim through. Reference materials from Jacobs and Chase (J&C), Operations and Supply Chain Management will be assigned as optional reading for each lecture.

# Class Preparation:

As indicated in the "Course Outline and Assignments" section of this syllabus, readings and case studies are assigned for most class sessions. The assigned material should be read before class

to facilitate discussions and understanding of the material covered in class. Also, case studies are assigned for most class sessions. You should read the assigned cases thoroughly and more than once to get a full understanding of the situations and issues raised and the data included. In class, we will discuss the case assigned and analyze it as a group.

Since class participation is a significant portion of your course grade, it is very important that you strive to be a vital contributor to such discussions. In an effort to encourage class participation, I will call on people and solicit contributions. The quality of your participation in discussions will be judged based on the content and depth of your comments, their relevance to the discussion, and your ability to move the class discussion forward.

# Executive Summaries and Case Statements:

There will be a total of *four* group case assignments. Specific questions and issues to be addressed are listed in the syllabus. The executive summary should be prepared and written as a *group* effort and may consist of no more than two pages of double-spaced text plus 1-3 pages of attachments consisting of supporting analyses and exhibits. All assignments should be typed. However, attachments containing diagrams or quantitative analysis may be (neatly) done by hand.

Additionally there will be *three* case individual assignments. You will be required to write a one to two paragraph description of the key problem and/or issue presented in the case. These are to be done on an *individual* basis.

In addition there will be concept checks and poll questions to answer. These will be done by each individual and also submitted through Canvas. Assignments are due at the start of class, and  ***late assignments will not be accepted.***

# Final Examination

The final examination will take three hours and will be open book, open notes, open computer but no internet allowed. More details will be given before the exam.

# Academic Integrity:

As a member of the Columbia Business School community, you are expected to “**adhere to and uphold the notions of truth, integrity, and respect**”. Any violation of the Honor Code will not be tolerated in this class. This includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person, or tampering with the academic work of other students.

Please refer to <http://www8.gsb.columbia.edu/honor/>for the Honor Code and further resources on academic integrity if you haven't already done so.

# Grading:

Your grade in the course will be based on your individual as well as group efforts and performance. Your performance will be judged through a variety of mechanisms that will enable us to assess your understanding of the tools and concepts covered your ability to synthesize, integrate, and apply them, and your contributions to the class's learning experience. Thus, in determining your course grade, we will use the following grading scheme to help us judge your performance:

Class Participation **20%**

Case statements (*Individual assignment*) **12%**

Shouldice Hospital Manzana Insurance Fresh Direct

Poll participation and concept checks (*Individual assignment*) **10%**

Executive Summaries (*Group assignment*) **24%**

Beleza Natural National Cranberry Ritz Carlton

Zara

Final Examination **34%**

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| **OVERVIEW OF ASSIGNMENTS (All assignments are due BEFORE class)**Detailed instructions can be found in syllabus and/or on Canvas |
| **Executive****Summary (G) Case State** | **ment (I) Concept Check (I) Poll (I)** |
| Class 1 |  |  |  |
| Class 2  | Shouldice |  |
| Class 3 Beleza | Process Flow Beleza |
| Class 4 NCC O |  |
| Class 5  | Manzana |  |
| Class 6  |  | NYPD |
| Class 7  |  | Queueing |  |
| Class 8  |  | SPC Ritz | Carlton |
| Class 9 Ritz Carlton Fresh Direct |  |
| Class 10 Za | ra Z |  |

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# COURSE OUTLINE AND ASSIGNMENTS

**Part I: Operations Strategy I & the Physics and Economics of Production**

**Class 1**

*Topics:*

Course introduction and overview. Operations strategy and business strategy.

*Plan:*

*We will discuss the role of operations in the firm and the alignment that is necessary to be successful. Examples will be given to see the relationships between leadership/culture, processes, systems, technology and people.*

*Based on your work experience, consider the following questions:*

What exactly are a firm’s operations? What do they entail? What techniques can be used to make a process efficient? What tradeoffs are involved?

***Reading:***

**J&C, pp. 1-14; 23-33.**

**Class 2**

*Topics:*

*The process perspective*

Plan:

*Read Shouldice Hospital. For class discussion, prepare answers for the following questions:*

1. Describe the Shouldice “production process.” What are the inputs, outputs, activities and

resources? What are the major process steps? (A diagram may be helpful.)

1. From a purely technological/process standpoint, what is appealing about the way Shouldice Hospital operates its business? In particular, how does the service process enable them to achieve high efficiency and productivity?
2. How would you characterize Shouldice Hospital’s operating strategy? Who is their target customer? What “product” do they provide? What competitive advantages do they have? How sustainable are they?

***Reading:***

**Shouldice Hospital Limited Bottleneck Analysis Production Processes**

**XTM Bike**

**J&C, pp.109-114**

***DUE:***

**Case Statement (individual): Shouldice Hospital. Answer question (3) above.**

**Class 3**

*Topics:*

Types of operating processes Bottleneck Analysis

Process analysis

*Plan:*

*Read Beleza Natural and be ready to answer the following questions:*

1. What are the key elements of Beleza Natural’s business strategy?
2. How does the firm structure its processes to support the strategy?
3. Consider the Madureira Institute. Ignoring the evaluation step for new customers, draw the process flow diagram associated with the operations of the institute. Then calculate the following quantities for a Saturday:
	1. The capacity of each step
	2. Identify the bottleneck and the process capacity
	3. The utilization of each step?
4. What improvement measures would you suggest to increase the process efficiency and enhance the performance of the institute?

***Reading:***

***Types of Processes Beleza Natural***

***J&C, pp. 153-156; 200-215.***

***DUE:***

**Executive Summary (group): Beleza Natural. Answer question (3) above. Concept Check (individual): Process Flow**

**Poll (individual): Beleza Natural**

**Review Session I:**

**Class 4**

*Topics:*

Mass customization

*Plan:*

Read the National Cranberry Cooperative (NCC) case and answer the questions below in an executive summary. Attach a **process flow diagram** and supporting calculations to your report.

1. Draw a process flow diagram showing the major process steps, inventories and flows. Indicate the capacity at each of the process steps. You should assume:
	1. roughly 16,400 barrels of cranberries arrive at NCC on average per day over the 20 days from 9/20-10/9 (as shown in Exhibit 2 of the case)
	2. each truck carries 75 barrels on average and that trucks arrive uniformly over a 12-hour period and
	3. trucks carry 70% wet berries and 30% dry berries.
2. Which operation (or operations) is the bottleneck? Note that both wet and dry berries can be run through the system at the same time.
3. How much overtime is required?
4. How bad is the truck delay? Estimate the time lost by drivers waiting to unload the trucks.
5. What are the basic options for improving the operation? Which options would you recommend and why? (Use data and analysis for supporting your recommendation.)

***Reading:***

***National Cranberry Cooperative (NCC) Ocado***

***DUE:***

**Executive Summary (group): National Cranberry Cooperative (NCC). Answer questions 1, 2 and 3 above.**

**Poll (individual): Ocado**

**Part II: Risk, Variability and Operations Excellence**

**Review Session II:**

**Class 5**

*Topics:*

Response time and service system design Call center management

The impact of demand and process variability; queuing models

*Plan:*

*Read Manzana Insurance. Based on the case, answer the following question:*

1. What is the bottleneck in Manzana's operations? [For your analysis, use the processing time data in Exhibits 4 and the request data for 1991 (6 months) in Exhibit 7].

In addition we will talk about queuing models

***Reading:***

**Queueing Management and Models Manzana Insurance**

**J&C, pp. 221-240.**

***DUE:***

**Case Statement (individual): Manzana Insurance. Answer question (1) above.**

**Class 6**

*Topics:*

A case on patrol car allocation - NYPD

*Plan:*

*What hypotheses can you suggest about the cause of Manzana's problems based on your analyses? What action(s) do you recommend to improve performance?*

*Re-read Manzana Insurance. For class discussion, prepare answers for the following questions:*

1. What problems is the Fruitvale Branch facing? Why have profits been deteriorating?
2. What are the important operational performance measures for Manzana? How are these tied to profitability?
3. What are your recommendations for managerial action? In particular, how should

Manzana respond to Golden Gate’s new policy of one-day service?

*Also, read the NYPD case and consider the following questions:*

1. Assume there are 18 cars to allocate among the six precincts A,..,F given in the case exhibit. Determine an allocation of these 18 cars and discuss the basis for your allocation
2. What is your objective in making this decision?
3. Why did you choose this objective? Explain.

***Reading:***

**New York City Police Department**

***DUE:***

**Poll (individual): NYPD**

**Class 7**

*Topics:*

The role of quality: definitions, quality and costs, improving quality Statistical process control

The magnificent seven

*Plan:*

*We will consider the following issues:*

1. What is statistical quality control and why is it important?
2. What is special and common cause variation? Why is it important to distinguish between the two?

***Reading:***

**Statistical Process Control J&C, pp. 316-330.**

**DUE:**

**Concept Check (individual): Queueing**

**Class 8**

*Topics:*

A case study of using data to achieve service excellence: Ritz-Carlton The Baldrige Award framework and 6. The Deming Cup.

Economic Order Quantity (EOQ)

*Plan:*

*Read the note on economic order quantity [EOQ] and consider the following questions for class discussion (We will analyze these questions in class):*

1. What are the advantages and disadvantages of batch production?
2. Consider how batch production could be implemented at XTM. In particular, should they use make-to-order batch production (i.e. collect batches of orders for similar bikes and then make the bikes once you receive enough orders of a given type) or make-to-stock batch production (make a batch of bikes in anticipation of orders)? What are the trade- offs involved?
3. In general, the EOQ describes what trade-off? What are the limitations of the model? How could it be used by XTM?

*Also, read the Ritz-Carlton case and be prepare to answer the following questions in class:*

1. What is Ritz-Carlton’s business strategy, e.g. who are their primary customers?
2. What do these customers want?

***Reading:***

**Ritz Carlton Hotel Company Economic Order Quantity (EOQ) J&C, pp. 295-309; 346-357.**

***DUE:***

**Concept Check (individual): Statistical Process Control (SPC) Poll (individual): Ritz Carlton**

**Review Session III:**

**Part III: Supply Chain Management & Operations Strategy II**

# Class 9

*Topics:*

Quantitative tools for managing inventories

*Plan:*

*The Excel file ritz.xls contains a listing of a subset of all defects reported in the DQPR for the Ritz-Carlton Buckhead over the period from January 1997 to November 1997. The subset contains all defects for twelve categories of defects that directly impact the customer and are identified as causes for customer dissatisfaction.*

*Analyze this data file and answer the following questions in an executive summary due at the start of class:*

* 1. What is Ritz-Carlton’s business strategy, e.g. who are their primary customers?
	2. How is quality defined at R-C? Does the data in the file ritz.xls indicate any significant quality problems?
	3. If you were to select a category of defect to address from the DQPR data, which category would you address? Why?
	4. For whatever defect category you selected, construct a p-chart to help identify days

on which some “assignable cause” of added defects arose.

* 1. Using the results of your analysis and any other relevant tools of quality, as well as your common-sense knowledge of hotel operations, generate hypotheses about the possible root causes of the defect category that you selected.

***Reading:***

**Analyzing Inventory Cost and Service in Supply Chains (skim) J&C, pp. 513-538.**

***DUE:***

**Executive Summary (group): Ritz Carlton Hotel. Answer questions 1, 2, 3, 4 and 5 above.**

**Case Statement (individual): Fresh Direct**

**Review Session IV:**

**Class 10**

*Topics:*

A case in high speed supply chain management: Zara Review

*Plan:*

*We will discuss Zara and have an overview of the course.*

*Read Zara and answer the following questions in an executive summary due at the start of class:*

1. What makes the Zara model successful?
2. Who do you think are Zara’s competitors? What advantages, if any, does it have over its competitors?
3. How far can Zara go with their manufacturing, distribution and retailing strategies?
4. Do you think marking price for multiple countries in a tag was a good idea? Why? Why not?

# Reading: Zara

**J&C, pp. 399-411.**

***DUE:***

**Executive Summary (group): Zara. Answer questions 1, 2, 3 and 4 above. Poll (individual): Zara**

**FINAL EXAMINATION**