<table>
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<th>#</th>
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<th>Topics</th>
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<td>Introduction</td>
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<td>Process analysis and valuing improvements</td>
<td>Beleza Natural (◊), Instructions to play Little Field Labs (◊), Production Processes</td>
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<td>Lean operations: The integrative auto industry case and applications to healthcare</td>
<td>Listen to NPR documentary (◊), Intermountain Healthcare Case Study</td>
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<td>7</td>
<td>6/13</td>
<td>Managing waiting time in service operations</td>
<td>Saintmarie ED (◊)</td>
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<td>Introduction to supply chain management: The Newsvendor model</td>
<td>L.L. Bean (◊), Betting on Uncertain Demand</td>
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(◊): Required. Other readings are optional, but recommended.
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 produces and delivers 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.
Methods and Materials
The course uses a variety of teaching methods and materials. Classes will consist of lectures, discussions, and video presentations. Fundamental concepts are contained in lecture notes and readings. Analytical tools are presented in notes, discussed in lectures, and reinforced by group as well as individual assignments. Cases are also used to illustrate the context and complexity of operations issues.

Text and Readings
We have divided the readings into required and optional readings. The required readings, indicated with an asterisk (♦) in the syllabus, should be read before class to facilitate comprehension and discussion. Recommended readings provide more background and depth of the material covered in the lectures. They help to clarify the topics covered in the lectures and provide some examples of practical applications. All readings are contained in a customized textbook that will be distributed in the first class. Use the syllabus as a guide for readings.

For those who would like to consult a textbook for additional readings, I recommend: “Matching Supply with Demand” by Cachon and Terwiesch. This book is held in the reserve of the library.

Groups
You should meet with your learning groups for doing the written group assignments, in-class exercises and general class preparation.

Class Preparation
We have made a sincere effort to keep the amount of reading for each class reasonable; in turn, however, we expect you to read the required materials and be well prepared for each class. Cases, in particular, typically require a detailed reading and will often require analysis of relevant data.

Conduct
Business School classes take place in an environment that supports learning and encourages the exchange of ideas. Behavior that distracts students and the professor negatively affects the learning environment. For example,
- using electronic devices (including laptops) for purposes not authorized by the professor,
- arriving late to class or leaving early, and
- walking in and out during class
are particularly detrimental to the classroom environment. Such conduct violates the School's Community Contract, the Columbia Core Culture, and/or the School's Electronic Device Policy, and is disrespectful to classmates and instructors.

Grading
Your grade in the course will be based on individual, as well as group efforts and performance. We will use the following weighting scheme:

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<th>Component</th>
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<tr>
<td>Class Participation</td>
<td>20%</td>
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<tr>
<td>Assignments (3)</td>
<td>15%</td>
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<tr>
<td>Littlefield Labs Game Write-Up</td>
<td>15%</td>
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<td>Final Exam</td>
<td>50%</td>
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**Class Participation**

We will judge class participation on the extent to which you appear prepared, the relevance and depth of your comments, the degree to which you listen carefully and respond to your peers, and your willingness to take chances in order to further the educational experiences of others. Please bring your tent (name) card to class. Please notify your instructor by email in advance if you have to miss a class, or if you will be late or leaving early from class.

**Homeworks**

- There are three homework assignments for the course and homeworks constitute 15% of your final grade.
- Homeworks are due at the beginning of the session on the assignment’s due date.
- Each student must turn in his or her own assignment for homeworks 1 and 3 (these are type B assignments). We encourage students to attempt completing the assignments on their own. However, to promote learning, students are allowed to discuss each assignment with other students.
- Homework 2 is a group assignment (type A).
- The assignments contain both quantitative and qualitative questions. Credit is not given on quantitative questions unless all work is shown.

**Littlefield Labs Game**

During the course, we will play an experiential game, “Littlefield Labs”, to get some hands-on experience on some of the concepts covered in class. The game simulates a laboratory that provides blood testing to customers, and each team will have to manage several aspects of the lab (input materials, capacity at several stages of the process, etc.) in order to maximize the profit of the company. Teams (formed by learning groups) will compete during one week, playing the game online (using a web browser) outside lecture hours. The grade for this activity will be calculated based your ranking in the competition (20%) and a write-up to be handed in at the end of the game (80%).

**Final Exam**

- The final exam is based on the content of the course: analytical tools, case discussions, lectures, etc.
- It is a 3-hour written exam.
- The format of the final exam is open book and open notes.
- Bring calculator but no laptops allowed.
- Date: Mon., June 30th
Class by Class Summary

Class 1

Topics:
Overview of the topics covered in the class. The operations function and the process view of operations.

Class Activities:
Course overview. Introduction to process analysis.

IMPORTANT:
Sign up for Littlefield by May. 30.
Littlefield game starts Monday Jun. 3 at 1:00pm and finishes Monday Jun. 10 at 1:00PM. There is an optional review session on Monday Jun. 2. The objective of this session is give you support for the game if needed.

Class 2

Topics:
Instructions for the Littlefield simulation.

Prepare:
Read “Beleza Natural”, and think about the following questions:

1. What are the key elements of Beleza Natural business strategy?
2. How does the firm structure its processes to support this strategy? Where do you see similar approaches adopted?
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:
   - the capacity of each step
   - identify the bottleneck and the process capacity
   - the utilization of each step
4. What improvement measures would you suggest to increase the process efficiency and enhance the performance of the institute? How would you prioritize among them?

Read Instructions to play Littlefield Labs.

Recommended optional reading: “Production Processes”.

Class Activities:
Introduce concepts for process analysis, and discuss Beleza Natural case.
We will also introduce the Littlefield game.
Class 3

Topics:
Lean operations, with applications to the automotive industry and to healthcare.

Prepare:
Listen to the first 30 minutes of the NPR American Life documentary about NUMMI.
http://www.thisamericanlife.org/radio-archives/episode/403/nummi
(the episode is also available on iTunes)

Recommended optional reading: “Intermountain Healthcare Case Study”

Class Activities:
Discuss the principle of lean operations, just-in-time production, and continuous improvement in the auto industry. This is part of the CBS integrated case on the auto industry.
Discuss the application of lean principals at Intermountain Healthcare.

Due:
Homework 1

Class 4

Topics:
Guest Lecture in Operational Excellence

Class Activities:
Attendance is required as it replaces a regular class.
Class 5

Topics:

Prepare:
Read the case “Improving Customer Engagement”. The data is in the excel spreadsheet on Canvas.

Recommended optional reading: “Statistical Process Control”.

Class Activities:
Think of the following issues:

1. Definition of quality.
2. What is statistical process control, and why is it important?
3. What is special and common cause variation? Why is it important to distinguish between the two?
4. Constructing and interpreting control charts.

We will use these concepts to discuss process capability and Six-Sigma.

Class 6

Topics:
(I) Applying quality management in service operations.
(II) Managing Variability and Waiting Times

Prepare:
Read “The Ritz-Carlton Hotel Company: The Quest for Service Excellence”.
Do Homework 2 (group assignment) about the case.


Class Activities:
Discuss Ritz Carlton Case.
Break.
Discuss the impact of variability and utilization on response times. Introduce queuing models and insights for the design of service operations.

Due:
Executive Summary for Homework 2: Ritz Carlton Hotel (group assignment).
Class 7

Topics:
Managing waiting time in service and healthcare operations.

Prepare:
Read “Emergency Department Congestion at Saintemarie University Hospital”.

You are Marc Dupont. You have to report back to the State Secretary with an action plan. Write that action plan.

For Class Discussion focus on:
1. What operational problems is Saintemarie Emergency Department facing? What is your assessment of the current performance and what do you think is driving these problems?
2. What are some possible alternatives for improving Saintemarie ED’s performance?
3. Through a back of the envelope calculation, evaluate the average time that patients wait before entering the care process. To do so, view the patient management activities and discharge as a single activity. How does that compare to the 1h10 minutes mentioned in the case?
4. How would you formulate performance targets for the ED?

Class Activities:
Discuss strategies for managing variability. Discuss Saintemarie ED case.

Class 8

Topics:
Introduction to Supply Chain Management. The Newsvendor Model.

Prepare:
Read “L.L. Bean, Inc.”.

For Class Discussion focus on:
1. What information should L.L. Bean use to decide how many units to stock? How could that information be obtained?
2. Which metrics would you use to evaluate stocking decisions?

Recommended optional reading: “Betting on Uncertain Demand: The Newsvendor Model”.

Class Activities:
In this lecture we will learn the Newsvendor model to understand the implications of production pre-commitment and risk in supply chain management.

Due:
Homework: Littlefield write-up (Group assignment). 2-page summary explaining your actions. See “Instructions to play Littlefield Labs” for more information.
Class 9

Topics:
Managing supply chains. Role of speculative and reactive capacities in matching supply with uncertain demand. Sourcing decisions.

Prepare:
Read “Sport Obermeyer, Ltd.”. Think about the following:

1. Using the sample data given in Exhibit 10, make a recommendation for how many units of each style Wally Obermeyer should order during the initial phase of production (a spreadsheet with Exhibit 10 is posted on Canvas). Assume there are no limits in the total size of the order (i.e. there is unlimited capacity), and ignore the minimum order quantity constraint in your analysis. Also, assume that there would be no future production for these parkas (i.e., only one production decision is taken to satisfy the demand). This question is part of Homework 3.

2. As indicated in the case, there are two production runs in Asia. The first production takes place six months before the Las Vegas show (production early), and the second one right after the show (production late). The production capacity after the show is limited and therefore some production must be done early. Discuss qualitatively the factors that Wally Obermeyer should consider in deciding which parkas to produce early and which to produce late.

Class Activities:
Discuss the benefits of reactive capacity and early sales forecasts for managing uncertain demand. Discuss different supply chains strategies.

Due:
Homework 3.

Class 10

Topics:
Course summary. Practice problems.

Prepare:
Review the concepts and tools learned in the course.

Class Activities:
This session will review some of the main concepts covered in class.